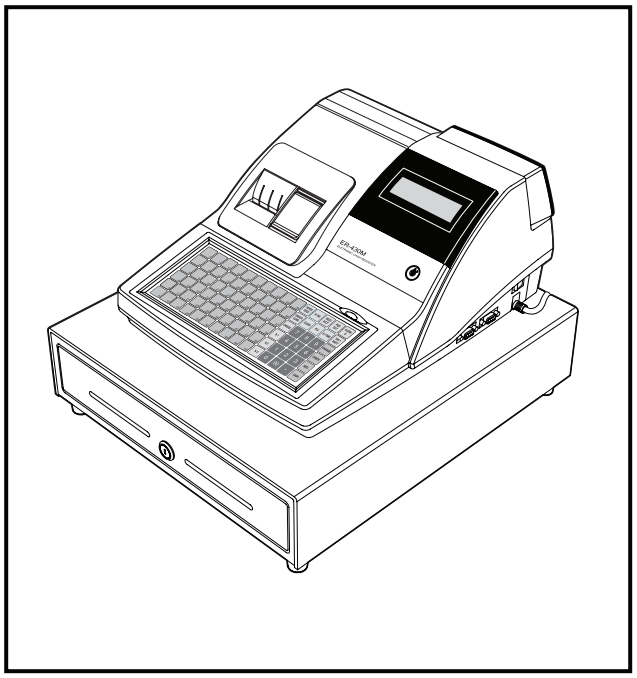
SAM4S

ELECTRONIC CASH REGISTER
ER-430 SERIES

SERVICE Manual

ELECTRONIC CASH REGISTER



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About this Manual

This service manual describes how to perform hardware service maintenance for the SAM4S ER-430 Series Electronic Cash Register.

Notes

Notes may appear anywhere in the manual. They describe additional information about the item.

Precaution symbols

⚠. Indicates a Safety Precaution that applies to this part component.

⚠. Indicates the part or component is an electro-statically sensitive device. Use caution when handling these parts.

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SAM4S ER-430 SERIES

Service Manual First Edition. June 2006.

V1.0

Printed in KOREA

Overview of this ECR

This service manual provides the technical information for many individual component systems, circuits and gives an analysis of the operations performed by the circuits. If you need more technical information, please contact our service branch or R&D center. Schematics and specifications provide the needed information for the accurate troubleshooting.

All information in this manual is subject to change without prior notice. Therefore, you must check the correspondence of your manual with your machine. No part of this manual may be copied or reproduced in any form or by any means, without the prior written consent of Shin Heung Precision .

Note: Before using this Electronic Cash Register (ECR) for the first time, leave it powered on in the REG mode for at least twenty-four hours. This allows the Ni-MH battery, which maintains the memory of the ECR while the power is off, to charge completely.

"Proper disposal of batteries is required. Refer to your local codes for disposal requirements."

1 Precaution Statements

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1 Safety Precautions

1. Be sure that all built-in protective devices are replaced. Restore any missing protective shields.
2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including nonmetallic control knobs and compartment covers.
3. Make sure there are no cabinet openings through which people - particularly children - might insert fingers and contact dangerous voltages.
   Such openings include excessively wide cabinet ventilation slots and improperly fitted covers and drawers.
4. Design Alteration Warning:
   Never alter or add to the mechanical or electrical design of the SECR. Unauthorized alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.
5. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or over- heating, and correct any potential hazards.
6. Observe the original lead dress, especially near the following areas : sharp edges, and especially the AC and high voltage supplies.
   Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.
7. Product Safety Notice:
   Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection.
   These safety features and the protection they give might be lost if the replacement component differs from the original - even if the replacement is rated for higher voltage, wattage, etc.

   Components that are critical for safety are indicated in the circuit diagram by shading, (⚠) or (⚠). Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose used batteries according to the manufacturer's instructions.

ATTENTION

ll y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.

Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

1-2 Servicing Precautions

WARNING: First read the-Safety Precautions-section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.

WARNING: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the units AC power cord from the AC power source before attempting to:
   (a) Remove or reinstall any component or assembly
   (b) Disconnect an electrical plug or connector
   (c) Connect a test component in parallel with an electrolytic capacitor
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples : metal panels and input terminals).
6. Insulation Checking Procedure:
   Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of AC plug.
   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect an instrument's ground lead to the instrument chassis ground before connecting the positive lead ; always remove the instrument's ground lead last.

1-3 Precautions for Electrostatic Sensitive Devices (ESDs)

1. Some semiconductor (solid state) devices are easily damaged by static electricity. Such components are called Electrostatic Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.
2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power - this is an electric shock precaution.)
3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.
5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.
6. Use only an anti-static solder removal device. Many solder removal devices are not rated as anti-static; these can accumulate sufficient electrical charge to damage ESDs.
7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

2 Product Specifications

Specifications are correct at the time of printing. Product specifications are subject to change without notice.
See below for product specifications.

2-1 General Specification

Item	Description	Remark
Processor	• MITSUBISHI M16C/80 Group M30800SFP (16 Bit)	External ROM Version
Memory	• RAM SRAM(K6T1008C2E) : 1MBITs or 2MBITs SRAM(K6T4008C2E) : 4MBITs × 1EA(Option) • ROM EPROM : 4MBITs (M27C4001) FLASH ROM : 8MBITs (AM29F800BB)	
Battery	• Type : Ni-MH, 3.6V 70mAh • Charging Time : 24 Hours • Life : 2 Years	
Data Storage	• 60 Days	When battery is Full charged
Interface Serial (RS-232C)	• Flow Control : ① DTR / DSR : H/W Flow Control ② XON / XOFF : S/W Flow Control • Baud Rate : 1200 / 2400 / 4800 / 9600 / 19200 Bps • Connector : DB9P Female (I/F PBA) • Voltage Supply : VCC(+5V/200mA) supplies at 9Pin of Connector.	RS-232C #1 RS-232C #2
Printer	• Model : Shin-Heung STM-320 • Print Speed : 75 mm/Sec (20 Line/sec)	Detail Spec refer to Next Page
Display	• Operator Display : 16*2 Character LCD (ER-430M) • Customer Display : 10 Digits VFD (ER-430 or ER-430F)	
Key Board	• Flat Key : 90 key	
Power Consumption	• Approx. 25W (Regularity)	
Power Requirement	• AC 120V 60Hz, 230V 50Hz	
Environment Condition	• Temperature : 0℃ ~ 45℃ • humidity : 30% ~ 80% RH	
Dimensions(mm)	400(W) x 450(D) x 266(H) ; with Drawer	Set

Table2-1 General Specification

2-2 Appearance

2-2-1 Appearance Dimensions (mm)

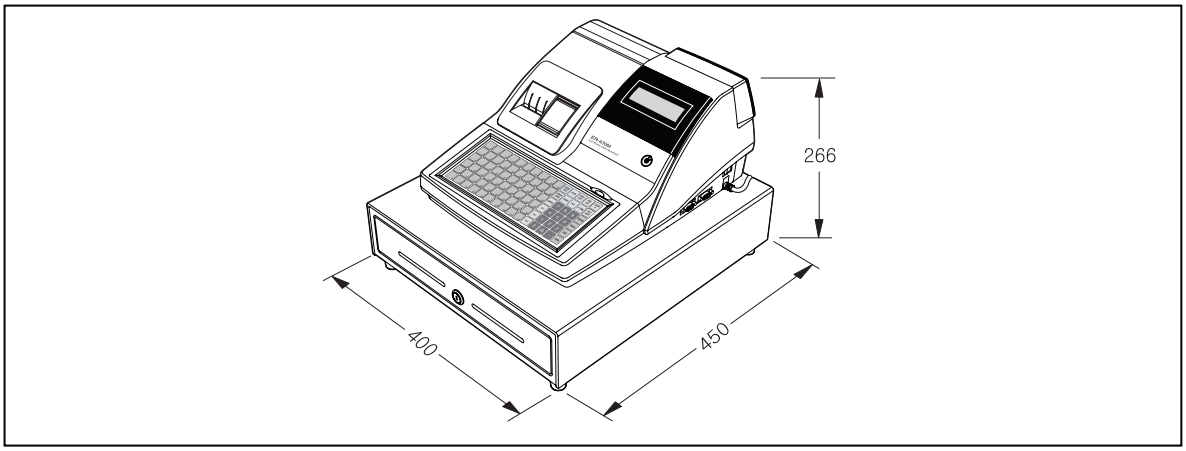


Figure2-1 Dimensions

2-2-2 Location Feature

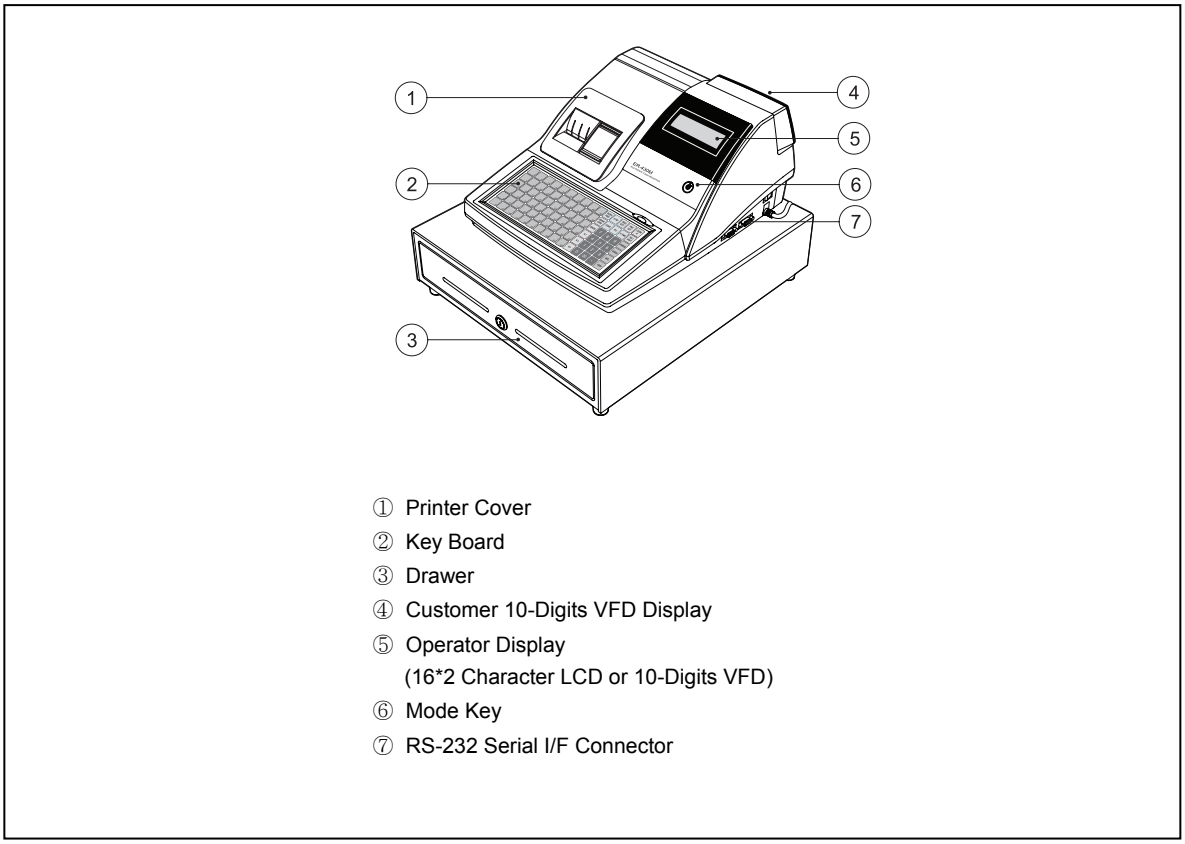


Figure2-2 Location Feature

2-3 Thermal Printer Specification

2-3-1 Printer Specification

Item		Description	Remark
Model		• STM-320	
Print Method		• Thermal Line Printing	
Printing Format	Total number of dots	• 640 Dots / Line	
	Dot Pitch	• Vertical : 0.125 mm (8dots/mm) • Horizontal : 0.125 mm (8dots/mm)	
Printing Speed		• 75 mm/Sec (20 Line/sec)	
Printing Direction		• Unidirectional Friction Feed	
Paper Feeding	Feeding Method	• Friction Feed	
	Minimum Feed Pitch	• 0.125 mm	
	Feeding Speed	• 75 mm/Sec (20 Line/sec)	
Power Supply Volt	Power Voltage	• 24.0V (Recommend)	Head/Motor
	Circuit Input Voltage	• 5V	Head Control/Sensor
Printer Head	Heat Element Density	• 8 Dots/mm (230dpi)	
	Total Head Elements	• 640 Dots/Dot Line	
	Available Printing Width	• 38.0mm x 2	
	Heat Element Typical Ω	• 800 Ω ±3%	
Line Feed Motor		• 2-Phase 20 step Stepping Motor	
Sensor	Head Temperature	• Thermistor	
	Paper-End Sensor	• Reflecting Photo Sensor	2pcs
Reliability	Life	• 15,000,000 Lines	
	MCBF	• 37,000,000 Line	
Dimension (mm)		•131.8(W) ×174.2 (D) ×135.7 (H)	
Weight		• Approx. 408.0 g	

Table2-2 Thermal Printer Specification

2-3-2 Character Specification

Item	Description	Remark
Character Structure	• 12(W) × 24(H) Dots (Including a Horizontal)	
Character Size	• 1.25 mm(W) ×3.0 mm(H)	
Column Pitch	• 1.5 mm	
Line Pitch	• 3.75 mm (Including 6-dot Line Spacing)	Programable
Number of Column	• 24+24 (12×24 Font)	

Table2-3 Character Specification

2-3-3 Paper Specification

The following paper should be used for good print quality and stable paper feeding.

Item			Description	Remark
Paper Type(standard)			• Han-sol "x" Paper: HPK-110 • Single-ply Thermal Paper Roll	Han-sol Patec CO.,LTD.
Paper Roll Spec	Width		• 44.5±0.5	
	Maximum Outside Diameter		• Max ø 70.0	
	Roll Core (Diameter)	In	• ø12.0±1.0	
		out	• ø18.0±1.0	
Paper Thickness			• 67±4㎛	

Table2-4 Paper Specification

Note: The Following paper can be used instead of the specified paper above.
TF50 KS-E : Nippon Paper industries Co.Ltd.
PD 160R : NEW Oji Paper Mfg, Co.Ltd
F380 : Kansaki Specialty Papers, Inc.(USA)

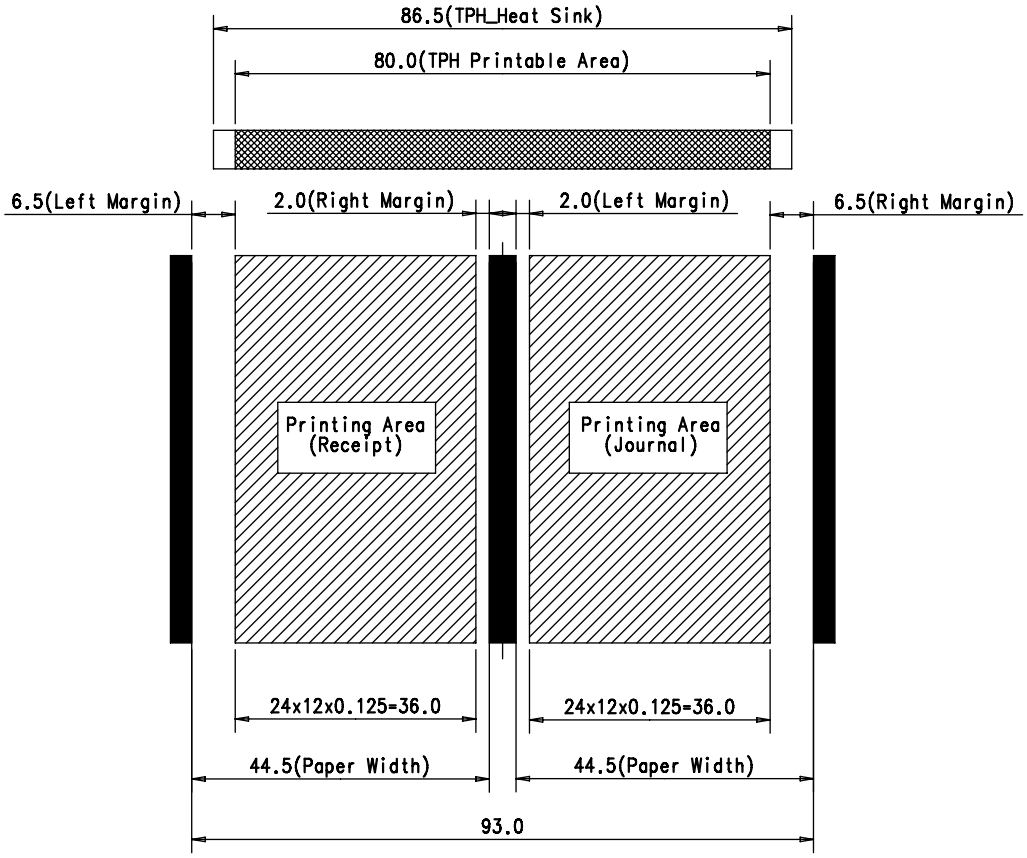


Figure2-3 Printing Dots and Printing Area

Note: The left and right margins may vary between 2mm and 0.5mm. The user should design the printing layout, taking this into account.

2-4 Power Specification

Item	Description	Remark
Input Voltage & Current	• U.S.A : AC 120V, 60Hz,0.3A (Min : 102V, Max : 138V) • Europe : AC 230V, 50Hz,0.16A (Min : 195.5V, Max : 264.5V)	Max & Min : ±15%
Power Consumption	• Operating : 25W	
Output Voltage	• AC 19V 2.3A (Wire Color : Blue-Blue) • AC 24V 0.15A (Wire Color : Red-Red)	Power Transformer Output

Table2-5 Power Specification

2-5 Interface Specification

2-5-1 RS-232C Serial Interface

2-5-1-1 Specification

Item	Description	Remark
Data Transmission	• Serial	
Synchronization	• Asynchronous	
Hand Shaking (Flow Control)	• H/W : DTR / DSR • S/W : XON / XOFF	XON : ASC Code 11h XOFF : ASC Code 13h
Signal Level	• Logic"1" (MARK) : -3V ~ -15V • Logic"0" (SPACE) : +3V ~ +15V	
Baud Rate	• 1200 / 2400 / 4800 / 9600 / 19200 bps	
Data Word Length	• 7 Bit / 8 Bit	
Parity	• None / Even / Odd	
Connector	• DB9P Female	
Voltage Supply	• VCC(+5V/200mA) is supplied at 9Pin of D-SUB Connector.	For Bar Code Reader or other devices

Table2-6 RS-232C Specification

2-5-1-2 Cable Connection

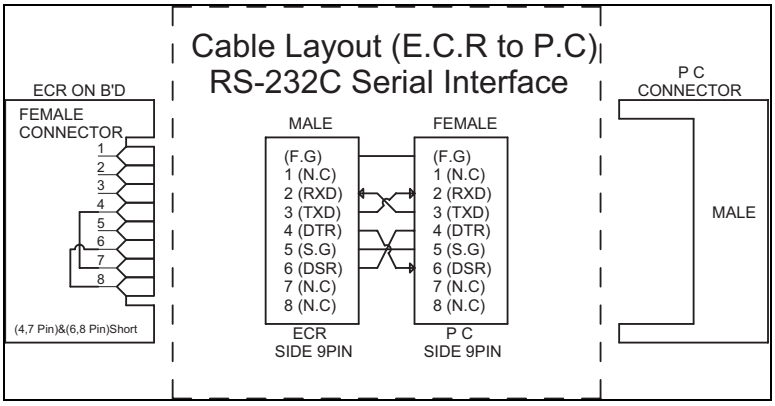


Figure2-4 RS232C Cable Connection (9Pin to 9Pin)

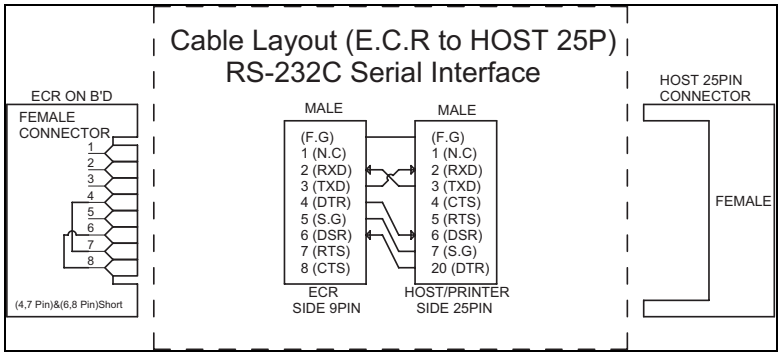


Figure2-5 RS232C Cable Connection (9Pin to 25Pin)

2-5-1-3 RS-232C I/F Cable

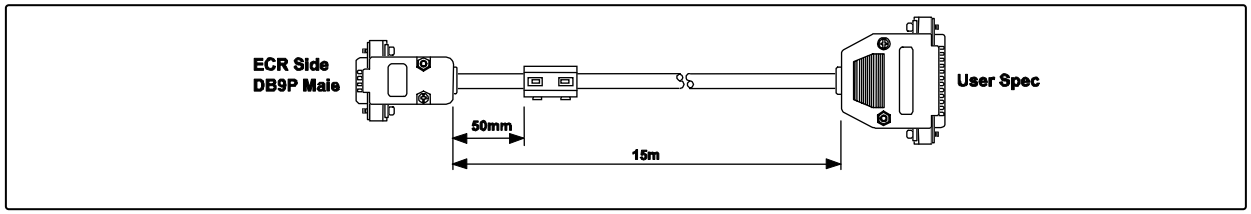


Figure2-6 RS-232C Cable

2-5-1-4 Signal Description

Pin No.	Signal Name	Signal Direction	Function
BODY	Frame GND	-	Frame Ground
2	RXD	Input	Receive Data
3	TXD	Output	Transmit Data
4	DTR	Output	This Signal indicates whether the ECR(ER-380) is busy. (H/W flow control) ① MARK(Logic1) : The ECR is busy ② SPACE(Logic0) : The ECR is not busy ③ The host transmits a data to the ECR, after confirming this signal. ④ When XON/XOFF flow control is selected, the host does not check this signal.
5	Signal GND	-	Signal Ground
6	DSR	Input	This signal indicates whether the host computer or receipt printer can receive data. (H/W flow control) ① MARK(Logic1) : The host can receive a data. ② SPACE(Logic0) : The host can not receive a data ③ The ECR transmits a data to the host or receipt printer, after confirming this signal. ④ When XON/XOFF flow control is selected, the printer does not check this signal.
9	VCC	Output	VCC(+5V/200mA) is supplied at 9Pin of D-SUB Connector.

Table2-7 RS-232C Signal Description

Caution: The VCC is supplied for the barcode or device power source. The Supply Current 200mA is total value including Serial-1 and Serial-2 Power Consumption. If the Total Power Consumption of the attached devices is exceeded the specification(200mA), the system stops the VCC of D-SUB Connector

Caution: If the device with 5V/200mA is connected to Serial-1, the VCC of Serial-2 can not use. If the device with 100mA is connected to Serial-1, Other device with 100mA can be connected to Serial-2 Port.

2-5-1-5 H/W Flow Control Timing

When DTR/DSR flow control is select, before transmitting a data, the ECR checks whether the host is BUSY or not. If the host is BUSY, ECR does not transmit a data to the host. If the host is not BUSY, ECR transmits a data to the Host. The host is the same. Refer to the Interface Part of Chapter 7(Special Circuit Diagrams).

2-5-1-6 S/W Flow Control Timing

When XON/XOFF flow control is selected, the ECR transmits XON(ASCII 11h) or XOFF(ACSII 13h) signal through the Serial Data Line. If the ECR is busy, the printer transmits XOFF(ASCII 13h) to host through the Serial Data Line. Then the host recognizes that the ECR is busy. So, the host does not transmit a data to the ECR. If the ECR is released from busy, the ECR transmits XON(ASCII 11h) to host through the Serial Data Line. Then the host recognizes that the ECR is not busy. And the host transmits a data to the ECR.

3 Installation and Operation

3-1 System Configuration

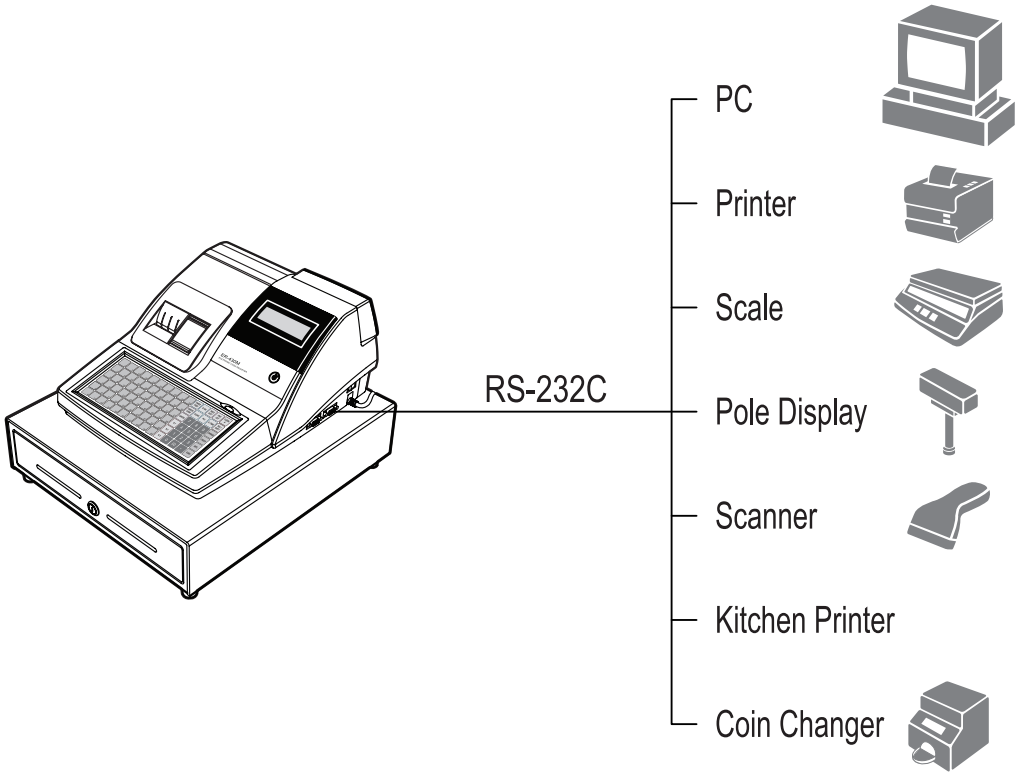
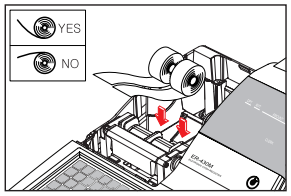


Figure 3-1 System Configuration

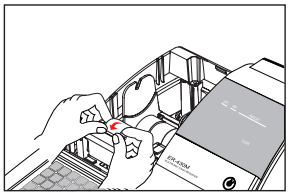
3-2 Installation

3-2-1 Paper Roll Installation

1. Open the PRINTER COVER.
2. Place a paper roll onto the concave bottom of the paper supply after the leading edge of the paper is being fed from the bottom of the roll.(Figure 3-2-1)
3. Using the Paper Auto-feed-Insert the leading edge of the paper into the slot between the Platen Roller and the Cover Guide until the paper is fed automatically by sensor.(Figure 3-2-2)
4. Using the Paper Manual-feed -Pull up the LEVER LOCK and the leading edge of the paper into the slot between the Platen Roller and the Cover Guide until the paper is fed to the Paper-Exit, between the TPH and Platen Roller. Return the LEVER LOCK.(Figure 3-2-3)
5. Tear the end of the paper on the left at the receipt printer like the shown figure.(Figure 3-2-4)
6. Push the button for paper feed on the keyboard to take up the leading edge of the paper to the Spool Winding on the journal printer on the right.(Figure 3-2-4)
7. Feed the leading edge of the paper in about 150mm and fold the tip in 20mm. Insert the leading edge of the paper into the slot on the Spool Winding.(Figure 3-2-5)
8. Insert the Spool Winding into the hole of Guide Winding like figure.(Figure 3-2-6)
9. Turn the Spool Winding in 2~3 turns.(Figure 3-2-7)
10. Place the Spool Winding on the Paper Supply. If it loosen, turn to tighten it.(Figure 3-2-8)
11. Close the PRINTER COVER.



(Figure 3-2-1)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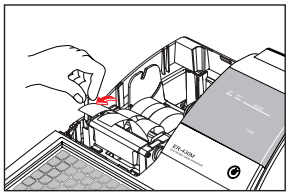
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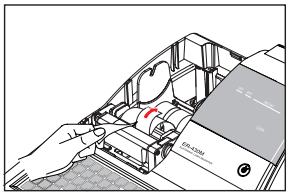
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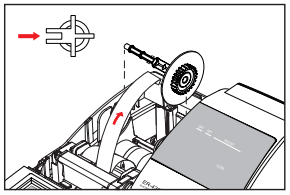
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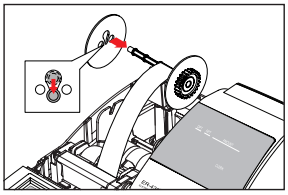
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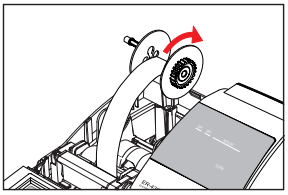

(Figure3-2-7)

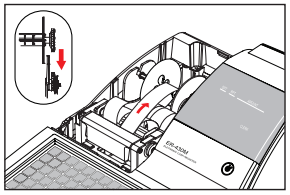

(Figure3-2-8)

Figure 3-2 Paper & Spool Installation

3-2-2 RS-232C Serial Cable Installation

1. Connect the RS-232C serial cable to the RS-232C serial port on the right side of ECR.
2. Secure the serial cable with screws.
3. Connector the other end of the RS-232C serial Cable to your host computer.

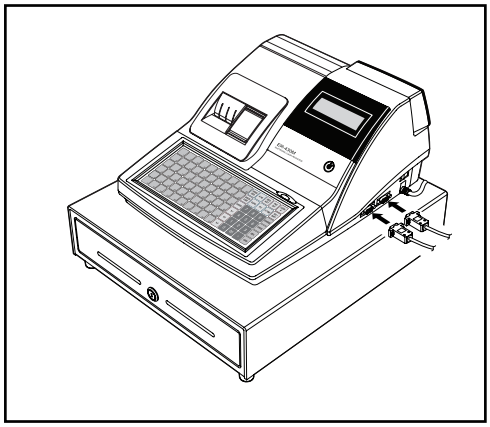


Figure 3-3 Cable Installation

3-2-3 Options

No.	Item	Description	Remark
1	Dust Cover		
2	Memory	SRAM 4MBITs (4MBITs * 1)	On Main PBA
3	Ass'y MCR	1 EA	Dealer Option

Table 3-1 Option

3-2-4 Supplies

No.	Item	Description	Remark
1	Paper Roll	2 EA	
2	Mode Key	VD, REG, Z, P, C	
3	User Manual	1 EA	
4	Spool	1 EA	

Table 3-2 Supplies

3-3 Operation

Note: Before using this Electronic Cash Register (ECR) for the first time, leave it powered ON in the REG mode for a at least 24 hours. This allows the Ni-MH battery, which maintains the ECR's memory while the power is OFF, to fully charge.

3-3-1 Mode Switch

The position of the Mode Key determines the action of the ECR. The modes are as shown in Table 3-3

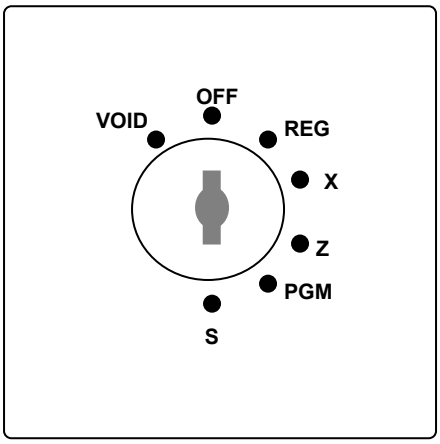


Figure3-4 Mode Switch

Mode	Function
VOID	Use to void (correct) items outside of a sale.
OFF	The Register is inoperable.
REG	Use for normal registrations.
X	Use to read register reports and perform other manager functions.
Z	Use to read register reports and reset totals to zero.
PGM	Use to program the register
S	Use for H/W tests and special setting.

Table3-3 Mode Switch Function

The mode switch can be used to access the following key lock positions.

Key	Accessible Position	Remark
VD	Void, Off, Register(REG), Manager(X)	
REG	Void, Off, Register(REG)	
Z	Off, Register(REG), Manager(X), Clear Totals(Z)	
P	Void, Off, Register(REG), Manager(X), Clear Totals(Z), Program(PGM)	
C	Void, Off, Register(REG), Manager(X), Clear Totals(Z), Program(PGM), Service Mode(S)	

Table3-4 Key Function

Note : The Key can be removed from the key lock in the OFF or REGISTER position.

3-3-2 Key Board Matrix (Dealer Option)

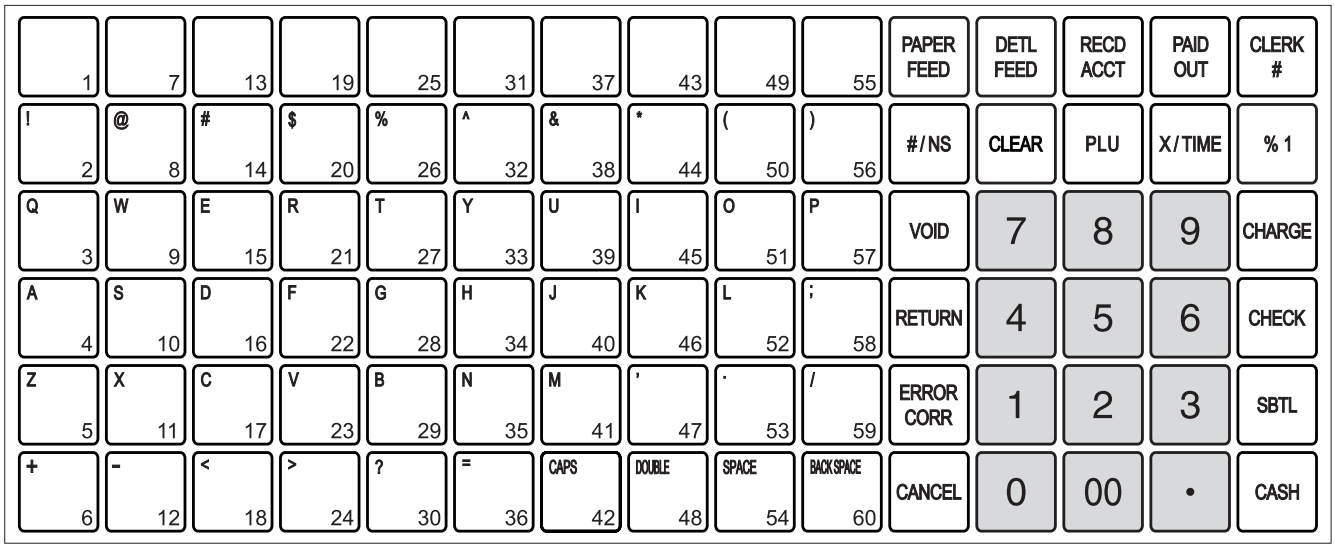

1 7 13 19 25 31 37 43 49 55 PAPER FEED DETL FEED RECD ACCT PAID OUT CLERK #
! 2 @ 8 # 14 $ 20 % 26 ^ 32 & 38 * 44 (50) 56 #/NS CLEAR PLU X/TIME %1
Q 3 W 9 E 15 R 21 T 27 Y 33 U 39 I 45 O 51 P 57 VOID 7 8 9 CHARGE
A 4 S 10 D 16 F 22 G 28 H 34 J 40 K 46 L 52 ; 58 RETURN 4 5 6 CHECK
Z 5 X 11 C 17 V 23 B 29 N 35 M 41 ' 47 . 53 / 59 ERROR CORR 1 2 3 SBTL
+ 6 - 12 < 18 > 24 ? 30 = 36 CAPS 42 DOUBLE 48 SPACE 54 BACK SPACE 60 CANCEL 0 00 • CASH

Figure3-5 Key Board(STD)

3-3-3 Initial Clear

1. Turn off the power switch.
2. Turn the mode switch marked '**P**' to **P-MODE**.
3. Hold down the '**SBTL**' key on the keyboard and turn on the power switch at the same time.

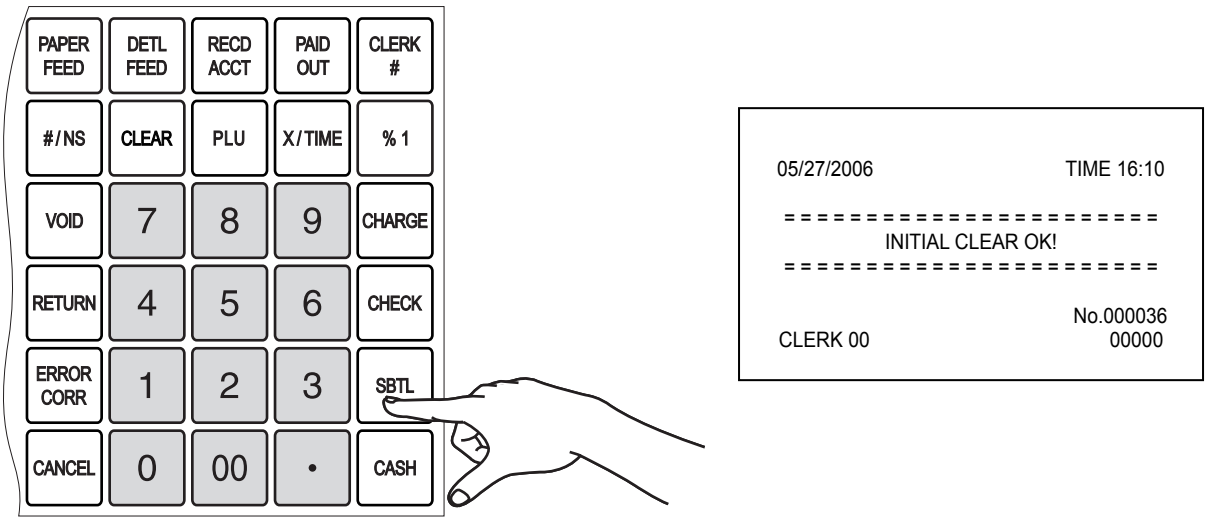

PAPER FEED DETL FEED RECD ACCT PAID OUT CLERK #
#/NS CLEAR PLU X/TIME %1
VOID 7 8 9 CHARGE
RETURN 4 5 6 CHECK
ERROR CORR 1 2 3 SBTL
CANCEL 0 00 • CASH
05/27/2006 TIME 16:10
= =
INITIAL CLEAR OK!
= =
No.000036
CLERK 00 00000

Figure3-6 Initial Clear Key & Print Sheet

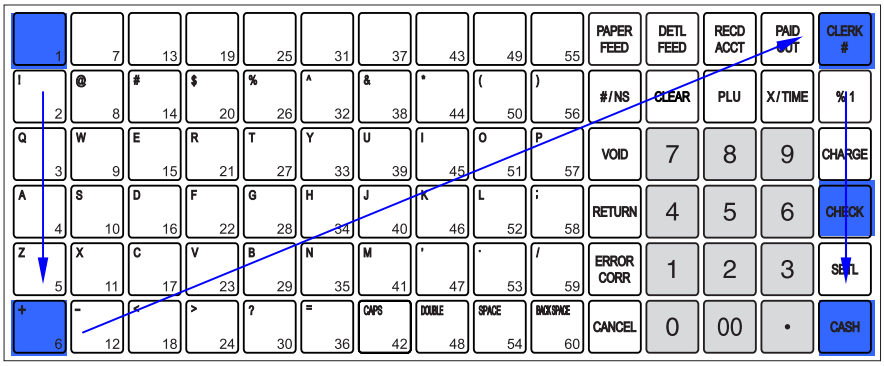
3-3-4 All Clear

This step insures that the cash register is cleared of any totals or programming. After this procedure, the cash register is ready for programming and operation.

WARNING: This is a one time procedure. Do not repeat this procedure after the cash register is programmed, it causes all programs and totals to be erased and to be default.

Note : Service Mode is not marked in a mode painting part.
Service Mode spins the Mode Key once just in a Program Mode to the right direction.
And need " C Key " to execute a Service Mode.

1. Turn off the power switch.
2. Turn the Mode switch to Service Mode position.
3. Press and hold the **CHECK** key on key board and turn on the power switch at the same time.
4. When the buzzer beeps, press '**1**', '**6**', '**CLERK #**', and '**CASH**' in sequence.
5. When memory is cleared, the register prints a message "RAM ALL CLEAR OK!"




```
05/27/2006                TIME 16:01
============================
        RAM ALL CLEAR OK !
============================
RAM     1 OK
RAM     2 OK
RAM     3 NG

ER-430M EPROM INFO.
VERSION        : STD 1.0
CHECKSUM    : C008
BOOT/APP     : C180/FE88
MAR   24   2006
                          No.000001
 CLERK 00                    00000
```

Figure3-7 All Clear Key Sequence & Print Sheet

3-3-5 Booting Area Download

1. Turn off the power switch.
2. Connect the serial#1 cable of register to PC.
3. Turn the mode switch to 'S'-MODE.
4. Press and hold the '**CASH'** key and '**CLERK#**' on key board and turn on the power switch at the same time.
5. The buzzer beeps several times.
6. Double Click '**DOWNLOAD.EXE**' program on your PC.
7. Select the booting file and PORT.
8. Select the 'Boot area only'.
9. Click 'OK'

3-3-6 Program Area Download

1. Turn off the power switch.
2. Connect the serial#1 cable of register to PC.
3. Turn the mode switch to 'S'-MODE.
4. Press and hold the '**CASH'** key and '**CLERK#**' on key board and turn on the power switch at the same time.
5. The buzzer beeps several times.
6. Double Click '**DOWNLOAD.EXE**' program on your PC.
7. Select the program file and PORT.
8. Select the 'Program Code only'.
9. Click 'OK'
10. Wait for about three minutes.
11. Turn off the power switch.
12. Remove the serial cable
13. Perform the all clear function

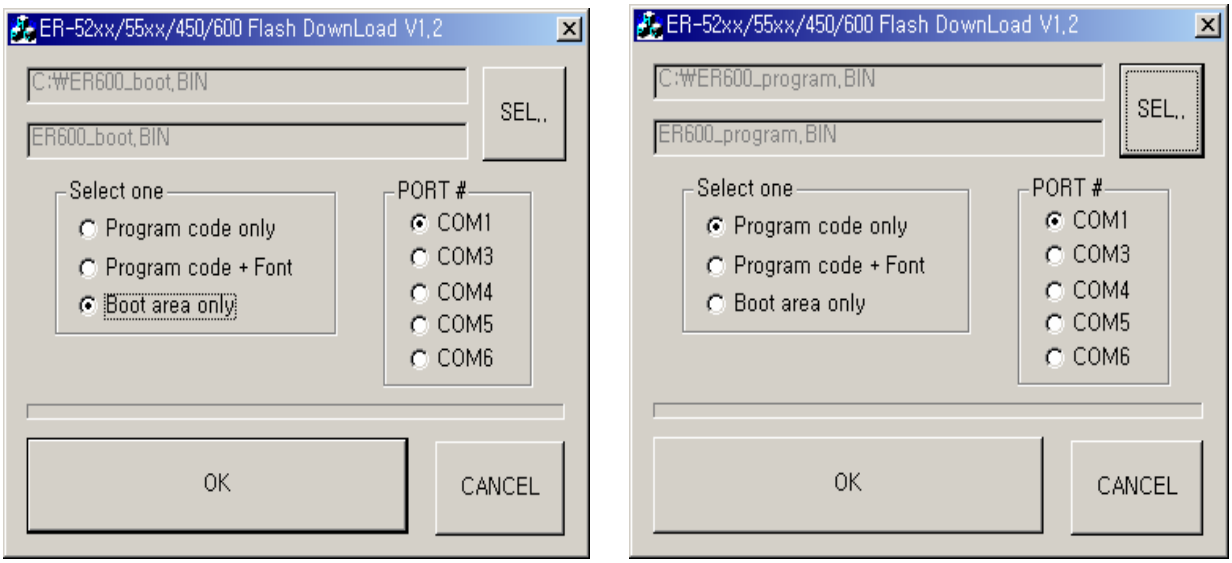


Figure3-7 Download Window (Boot & Program)

3-3-7 Self Test

3-3-7-1 Test Printer

1. Turn the Mode switch to Service Mode position.
1. Press '**1', '0'** and **'SBTL'** key on key board.
2. Then the printer prints the test pattern. The printing message shows some information sush as 'TM value','stbIdx (Strobe index)'.
3. After printing, The drawer is opened. Then the printer test is finished.

3-3-7-2 Test Display

1. Press '**1', '1'** and **'SBTL'** key on key board.
2. Then the buzzer will work for 1 sec.
3. After testing the buzzer, Some characters are displayed on the rear VFD display

3-3-7-3 Test Key Board

1. Press Press '**1', '2'** and **'SBTL'** key on key board.
2. Press any key you want on the key board.
3. The key code of pressed key will be showed on the VFD.
4. Turn the mode switch to any position to finish this test.

3-3-7-4 Test Mode Switch

1. Press Press '**1', '3'** and **'SBTL'** key on key board.
2. Turn the mode switch to any position.
3. The corresponding Mode name will be showed on the VFD.

3-3-7-5 Test RS232C (Serial 1)

1. Install the serial loop back test jig. (Short "pin 2,3" and "pin 4,6" of DSUB connector)
2. Press Press '**1', '4'** and **'SBTL'** key on key board.
3. If error occurs, the message (232 NOGOOD) is displayed on VFD and the Buzzer beep. Then Press **"Clear"** key.

3-3-7-6 Test RS232C (Serial 2)

1. Install the serial loop back test jig. (Short "pin 2,3" and "pin 4,6" of DSUB connector)
2. Press Press '**2', '4'** and **'SBTL'** key on key board.
3. If error occurs, the message (232 NOGOOD) is displayed on VFD and the Buzzer beep. Then Press **"Clear"** key.

Note : When the ports is unconnected with the cable , the Error occur.

4 Disassembly and Assembly

Caution :
· Before installation, be sure to turn off the power switch.
· Use gloves to protect your hand from being cut by the angle and the chassis.
· Connect all the cables correctly. When connecting or disconnecting the cables, be careful not to apply stress to the cables. (It may cause disconnection)
· Be careful not to bind interface cables and AC power cord together.
Note : Before disassembling, first of all separate the ASS'Y CASE UPPER(B) from the ASS'Y CASE LOWER(E). (Page 6-1)

4-1 Disassembling the Case Upper Block

4-1-1 Ass'y Case Upper

1. Open the ASS'Y COVER PRINTER(A) and lift it off. (Page6-1,Page6-2)
2. Remove the three screws(B-16:1pcs, B-18:1pcs,B-27:1PCS) from the ASS'Y CASE LOWER(E).(Page6-1, 6-3)
3. Separate the four harnesses(ⓒ,ⓓ,ⓜ,ⓝ) and two FPC (ⓤ,ⓥ) from the PBA-MAIN BOARD(E-2). (Page6-9)
4. Lift off the ASS'Y CASE UPPER(B) from the ASS'Y CASE LOWER(E). (Page6-1, 6-3)

4-1-2 Ass'y Front Display(LCD)

1. Separate the PMO-WINDOW LCD(B-11) from the PMO-WINDOW DISPLAY(B-12).(Page6-3)
2. Separate the PMO-WINDOW DISPLAY(B-12) from the ASS'Y CASE UPPER(B).(Page6-3)
3. Remove the four screws(B-24) from the ASS'Y CASE UPPER(B).(Page6-3)
4. Remove the four screws(B-21) from the PMO-HOLDER DISPLAY(B-23).(Page6-3)
5. Separate the LCD(B-22) from the PMO-HOLDER DISPLAY(B-23).(Page6-3)

4-1-3 Ass'y Rear (Turret) Display

1. First of all, separate the harness(ⓒ) of the REAR DISPLAY BOARD(B-14) from the PBA-MAIN BOARD(E-2). (Page6-9)
2. Separate the PMO-TURRET BODY (B-15) from the ASS'Y CASE UPPER (B). (Page6-3)
3. Separate the PMO-WINDOW TURRET(B-13) and the REAR DISPLAY BOARD(B-14) from the PMO-TURRET BODY (B-15).(Page6-3)

4-1-4 Ass'y Cover Mode Switch

1. Separate the ASS'Y COVER MODE S/W(B-10) from the ASS'Y CASE UPPER(B). (Page6-3)
2. Remove the two screws(B-5) on the ASS'Y COVER MODE S/W(B-10) and separate the MODE KEY ASS'Y(B-4) from the PMO-COVER MODE S/W(B-10). (Page6-3)
3. Remove the two screws(B-2) on the MODE KEY ASS'Y(B-4) and separate the IPR-BRKT MODE S/W(B-3) and the MODE KEY ASS'Y(B-4). (Page6-3)

4-1-5 Ass'y Cover MCR(OPTION)

1. Separate the ASS'Y COVER MCR(B-1) from the ASS'Y CASE UPPER(B). (Page6-3)
2. Remove the two screws(B-5) on the ASS'Y COVER MCR(B-1) and separate the MODE KEY ASS'Y(B-4) from the PMO-COVER MCR(B-1). (Page6-3)
3. Remove the two screws(B-2) on the MODE KEY ASS'Y(B-4) and separate the IPR-BRKT MODE S/W(B-3) and the MODE KEY ASS'Y(B-4). (Page6-3)
4. Remove the three screws(B-9) from the ASS'Y COVER MCR(B-1) and separate the COVER-SLOT(B-8) from the ASS'Y CASE UPPER(B). (Page6-3)
5. Remove two screws(B-6) from the COVER-SLOT(B-8) and separate the MCR(B-7) from the COVER-SLOT(B-8). (Page6-3)

4-2 Disassembling the Case Lower Block

4-2-1 Ass'y Printer

1. Open the ASS'Y COVER PRINTER(A) and lift it off. (Page6-1. 6-2)
2. Separate the GROUND WIRE(ⓐ,ⓦ) from the ASS'Y CASE LOWER(E). (Page6-9)
3. Remove the four screws(E-1) from the PMO-HOLDER PRINTER(C-5-24) and PMO-PAPER SUPPLY (C-4-2).(Page6-5)
4. Separate the ASS'Y PRINTER(C) from the ASS'Y CASE LOWER(E). (Page6-9)

4-2-2 Ass'y Main PBA, Fiscal PBA and I/F PBA

1. Separate the nine harnesses(ⓒ,ⓓ,ⓔ,ⓜ,ⓝ,ⓕ,ⓣ,ⓠⓡ,C-8) and remove the three screws(E-3).
2. Lift up the PBA-MAIN BOARD(E-2) and ASS'Y FISCAL BOARD(E-16) from the PMO-CASE LOWER(E-24).(page 6-9)
3. Separate the harness (ⓔ) and Remove the two screws(E-11). (page6-9)
4. Lift up the PBA-I/F BOARD(E-12).(page6-9)

4-2-3 Ass'y Power PBA, and Power Trans

1. Separate the harnesses(ⓕ,ⓙ) and Remove the two screws(E-4). (page6-9)
2. Separate the TRANS-POWER (E-5) from the IPR-BRKT TRANS(E-15).(page6-9)
3. Separate the harnesses(ⓗ,ⓙ,ⓚ) and Remove the two screws(E-8). (page6-9)
4. Lift up the PBA SUB POWER SW(E-9) from the IPR-BRKT TRANS(E-15).(page6-9)
5. Remove the five screws(E-6:3PCS, E-7:2PCS) and Separate the IPR-BRKT TRANS(E-15) from the PMO-CASE LOWER(E-24).(page6-9)

5 Maintenance and Adjustment

5-1 Cleaning the Printer Head

Paper dust on the heating elements may lower the print quality. In this case, clean the print head as follows. After printing, the printer head can be very hot. Be careful not to touch it. Also let it cool before you clean it. Do not damage the printer head by touching it with your fingers or any hard object.

1. Turn power off.
2. Pull up the LEVER LOCK and then Pull the TPH ASS'Y forwards until it can't move carefully with one hand. Use the other hand to clean the TPH with the TPH ASS'Y pulled.
3. Clean the Printer Head Thermal Element with a cotton swab moistened with alcohol solvent. (ethanol, methanol or IPA)
4. After confirming that alcohol solvent has been dried up completely, close the LEVER LOCK.
5. If you don't use it for a long time, place a piece of paper between TPH and platen roller to protect the printer.

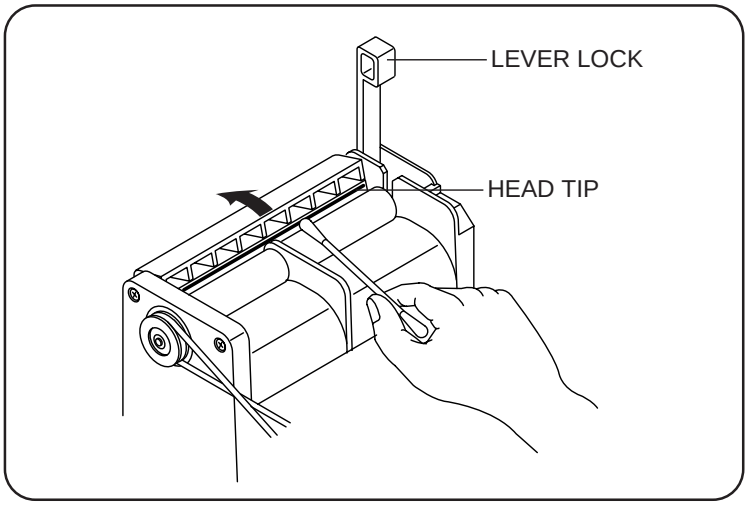


Figure 5-1 Clean the Printer Head

Caution: Note that the thermal head(Thermal Element and Radiation Plate) becomes very hot during normal operation. To prevent the danger of burn injury from thermal, be sure to wait for about 10 minutes after turning power off before beginning the cleaning.

Warning

The products are designed for use in a standard environment and not in any special environments. Application of the products in a special environment can deteriorate product performance. Accordingly, verification and confirmation of product performance, prior to use, is recommended if used under the following conditions

- **a.** Use in various type of liquid, including water, oils, chemicals and organic solvents
- **b.** Use outdoors where the products are exposed to direct sunlight, or in dusty places.
- **c.** Use in places where the products are exposed to sea winds or corrosive gases, including CL_2 , H_2S, SO_2, NH_3 and NO_2
- **d.** Use in places where the products are exposed to static electricity or electromagnetic waves
- **e.** Use of the products in places subject to dew condensation.

MEMO

6 Exploded Views and Parts List

6-1 Exploded View

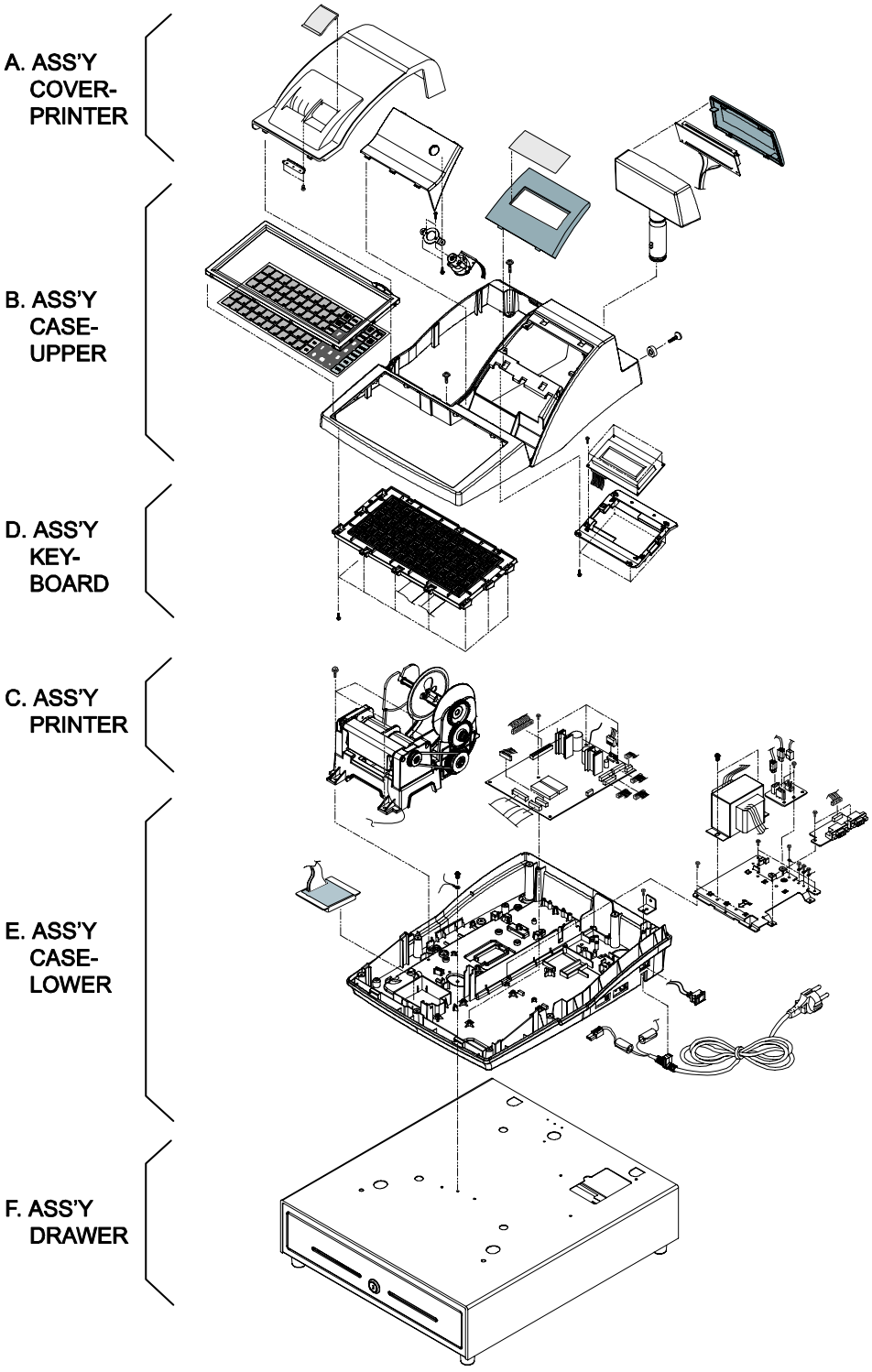


Figure 6-1 Total Disassembly

6-2 Parts List

6-2-1 ASS'Y COVER-PRINTER

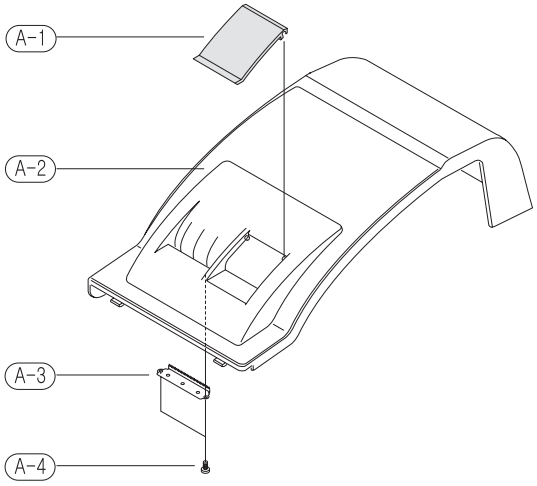


Figure 6-2 ASS'Y COVER-PRINTER

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
A	**JK97-20017A**	**MEA-COVER PRINTER**	**1**		**Y**	
A-1	JK72-20087A	PMO-WINDOW JOURNAL	1		Y	
A-2	JK72-20086A	PMO-COVER PRINTER	1		Y	
A-3	JK70-20021A	IPR-CUTTER PAPER	1		Y	
A-4	JK70-50012A	SCREW-TAPPING;PH,+,M2.6,L6	2		Y	

6-2-2 ASS'Y CASE-UPPER

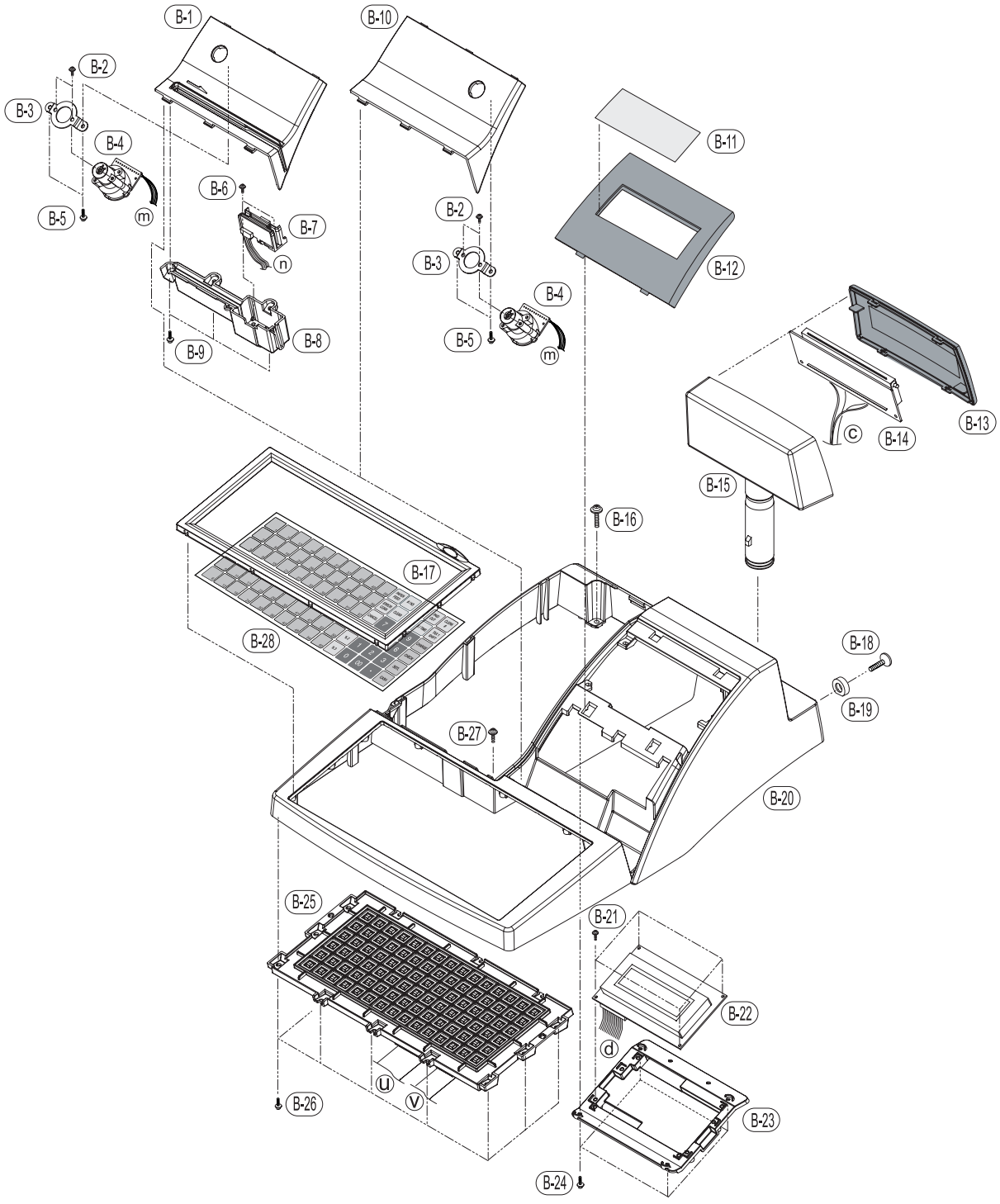


Figure6-3 ASS'Y CASE-UPPER

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
B-1	JK72-20215B	PMO-COVER MCR	1		Y	OPTION
B-2	6002-000319	SCREW-TAPPING	2		Y	
B-3	JK70-10004A	IPR-BRKT MODE_S/W	1		Y	
B-4	JK96-10044A	MODE KEY ASS'Y	1		Y	
B-5	6002-000319	SCREW-TAPPING	2		Y	
B-6	6002-000319	SCREW-TAPPING	2		Y	
B-7	JK48-00006A	MCR:MSR-1150-SH,TRACK1-2,43mm	1	TRACK 1-2	Y	OPTION
	JK48-00005A	MCR:MSR-1160-SH,TRACK2-3,43mm	1	TRACK 2-3	Y	OPTION
B-8	JK72-20216A	PMO-COVER SLOT	1		Y	OPTION
B-9	6002-000175	SCREW-TAPPING	3		Y	OPTION
B-10	JK72-20214B	PMO-COVER MODE	1		Y	
B-11	JK72-20091A	PMO-WINDOW LCD	1		Y	
B-12	JK72-20065A	PMO-WINDOW DISPLAY	1		Y	
B-13	JK72-40209B	PMO-WINDOW TURRET	1		Y	
B-14	JK92-00970B	PBA SUB-TURRET	1		Y	
B-15	JK72-00015A	PMO-TURRET BODY	1		Y	
B-16	6002-000172	SCREW-TAPPING	1		Y	
B-17	JK75-20033A	ASS'Y KBD HOUSING	1		Y	
B-18	6001-000367	SCREW-MACHINE	1		Y	
B-19	JK70-40305A	ICT-SHAFT MOLDING	1		Y	FISCAL
B-20	JK72-20213A	PMO-CASE UPPER	1		Y	
	JK72-20213B	PMO-CASE UPPER	1		Y	FISCAL
B-21	6002-000175	SCREW-TAPPING	4		Y	
B-22	JK07-00007A	LCD:16CHAR*2LINE	1		Y	
B-23	JK72-20110A	PMO-HOLDER DISPLAY	1		Y	
B-24	6002-000175	SCREW-TAPPING	4		Y	
B-25	JK59-30027A	UNIT-KEYBOARD	1		Y	
B-26	6002-000174	SCREW-TAPPING	12		Y	
B-27	6002-000172	SCREW-TAPPING	1		Y	
B-28	JK68-40066A	LABEL(P)-KBD SHEET:STD,90KEY	1		Y	ENGLISH
	JK68-40066B	LABEL(P)-KBD SHEET:MUL,90KEY	1		Y	GERMAN

6-2-3 ASS'Y PRINTER (STM-320)

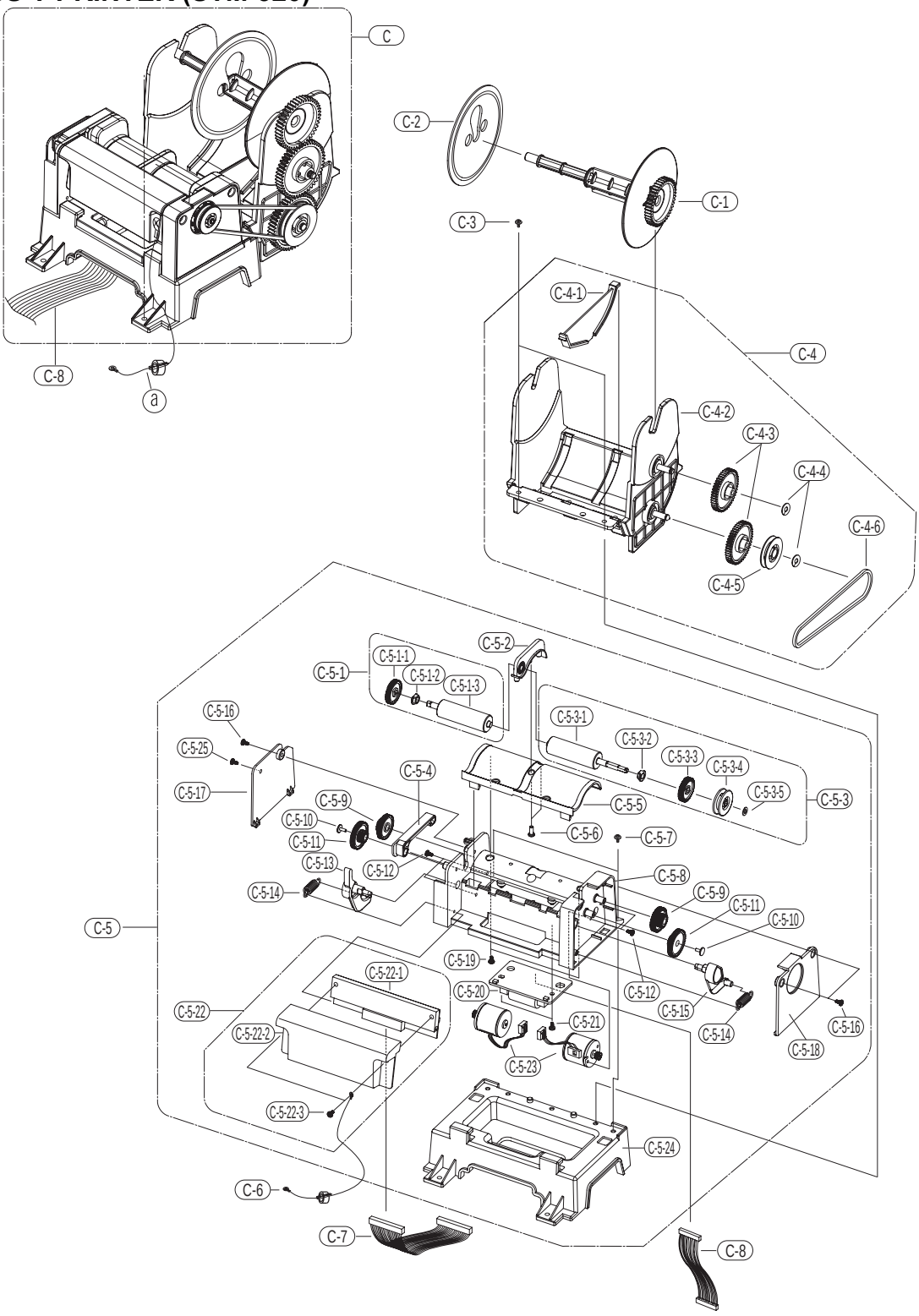


Figure 6-6 ASS'Y PRINTER(STM-320)

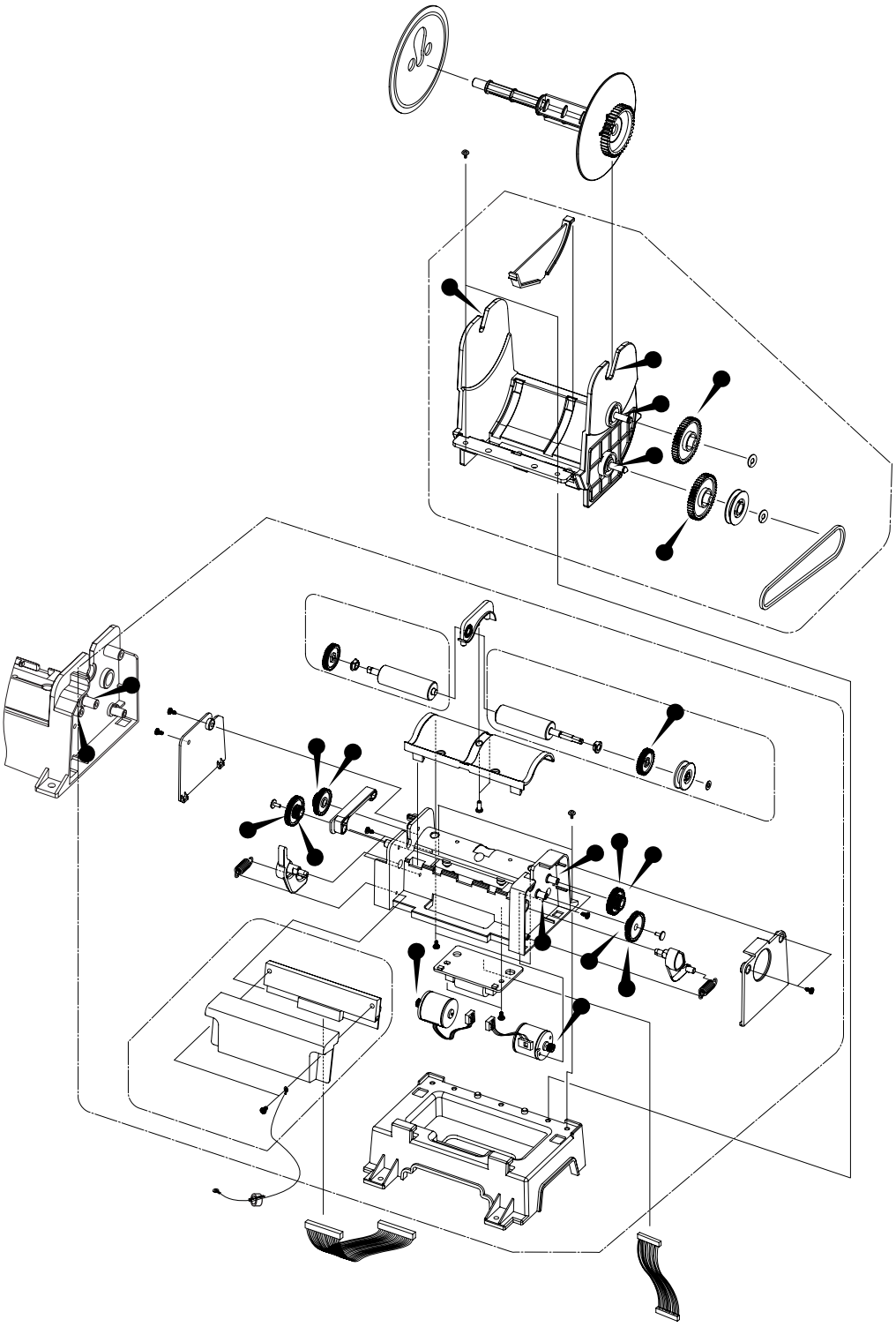


Figure 6-7 Lubrication Points of the Printer (STM-320)

No.	Code No.	Description / Specification	Q'TY	Serviceable	Remarks
C	JK59-20004A	UNIT-PRINTER:STM-320	1	Y	
C-1	JK72-20081A	PMO-SPOOL WINDING_320	1	Y	
C-2	JK72-20093A	PMO-GUDIE WINDING	1	Y	
C-3	6003-000198	SCREW-TAPPING:PWH,+,2,M3,L12	2	Y	
C-4	JK97-20022A	ASSY SPOOL;STM-320	1	Y	
C-4-1	JK72-20082A	PMO-PARTITION PAPER:STM-320	1	Y	
C-4-2	JK97-20027A	ASSY-PAPER SUPPLY;STM-320	1	Y	
	JK72-20076A	PMO-PAPER SUPPLY:STM-320	1	N	
	JK70-50021A	ICT-SHAFT SPOOL:STM-320	2	N	
C-4-3	JK72-20084A	PMO-GEAR SPOOL_47	2	Y	
C-4-4	JK70-50022A	POLY WASHER: CUT TYPE/ IDØ3.6,ODØ10	2	Y	
C-4-5	JK72-20083A	PMO-PULLEY SPOOL:STM-320	1	Y	
C-4-6	JK70-60006A	RMO-RUBBER BELT:STM-320	1	Y	
C-5	JK97-20024A	ASSY-MAIN FRAME;STM-320	1	Y	
C-5-1	JK97-20025A	ASSY-ROLLER_320L;STM-320	1	Y	
C-5-1-1	JK72-20077A	PMO-GEAR ROLLER_43:STM-320	1	N	
C-5-1-2	JK70-50019A	ICT-BUSHING_PI4:STM-320	1	N	
C-5-1-3	JK70-60004A	PLATEN ROLLER_320L:STM-320	1	N	
C-5-2	JK97-20028A	ASSY-GUIDE PARTITION ;STM-320	1	Y	
	JK72-20085A	PMO-GUIDE PARTITION:STM-320	1	N	
	JK70-50020A	ICT-BUSHING_INSERT:STM-320	1	N	
C-5-3	JK97-20026A	ASSY-ROLLER_320R;STM-320	1	Y	
C-5-3-1	JK70-60003A	PLATEN ROLLER_320R:STM-320	1	N	
C-5-3-2	JK70-50019A	ICT-BUSHING_PI4:STM-320	1	N	
C-5-3-3	JK72-20077A	PMO-GEAR ROLLER_43:STM-320	1	N	
C-5-3-4	JK72-20078A	PMO-PULLEY SMALL:STM-320	1	Y	
C-5-3-5	JK70-50004A	POLY WASHER, IDØ2.8,ODØ6.0,T0.5(RED)	1	Y	
C-5-4	JK72-20074A	PMO-LEVER LOCK:STM-320	1	Y	
C-5-5	JK72-20079A	PMO-COVER GUIDE_320:STM-320	1	Y	
C-5-6	JK70-50012A	SCREW-TAPPING*PH,+,M2.6,L6	2	Y	
C-5-7	6003-000198	SCREW-TAPPING:PWH,+,2,M3,L12	2	Y	
C-5-8	JK72-20066A	PMO-FRAME MAIN:STM-320	1	Y	
C-5-9	JK72-20071A	PMO-GEAR R49_21:STM-320	2	Y	
C-5-10	JK70-50018A	ICT-SHAFT PIN:STM-320	2	Y	
C-5-11	JK72-20070A	PMO-GEAR R59_23:STM-320	2	Y	
C-5-12	JK70-50009A	SCREW-MACHINE:RH,+,M2,L4	4	Y	
C-5-13	JK70-20022A	ICT-LEVER LEFT:STM-320	1	Y	
C-5-14	JK70-30004A	SPRING-TPH:STM-320	2	Y	
C-5-15	JK70-20023A	ICT-LEVER RIGHT:STM-320	1	Y	
C-5-16	JK70-50012A	SCREW-TAPPING*PH,+,M2.6,L6,ZPC	4	Y	
C-5-17	JK72-20067A	PMO-COVER LEFT:STM-320	1	Y	
C-5-18	JK72-20068A	PMO-COVER RIGHT:STM-320	1	Y	
C-5-19	JK70-50028A	SCREW-TAPPING;PWH,+,M2.6,L4	2	Y	
C-5-20	JK92-01265A	PBA SUB-CONNECTION BOARD:STM-310/320	1	Y	
C-5-21	JK70-50025A	SCREW-TAPPING;PWH,+,M2.6,L6,ZPC	2	Y	
C-5-22	JK97-20023A	ASSY TPH;STM-320	1	Y	
C-5-22-1	JK47-10002A	THERMAL PRINT HEAD	1	Y	
C-5-22-2	JK72-20069A	PMO-COVER TOP:STM-320	1	Y	
C-5-22-3	6001-000666	SCREW-MACHINE:PWH,M3,L6	2	Y	
C-5-23	JK59-40003A	UNIT-MOTOR ASSY:STM-320	2	Y	
C-5-24	JK72-20075A	PMO-HOLDER PRINTER:STM-320	1	Y	
C-5-25	JK70-50026A	SCREW-TAPPINGE:PWH,M2.6,L8		Y	
C-6	JK39-40611A	HARNESS-GND: 200mm,CORE	1	Y	
C-7	JK39-40632A	HARNESS-CONNECTION;STM-320,16P	1	Y	
C-8	JK39-00012A	CBF-HARNESS-KEY OPTION	1	Y	

6-2-4 ASS'Y KBD

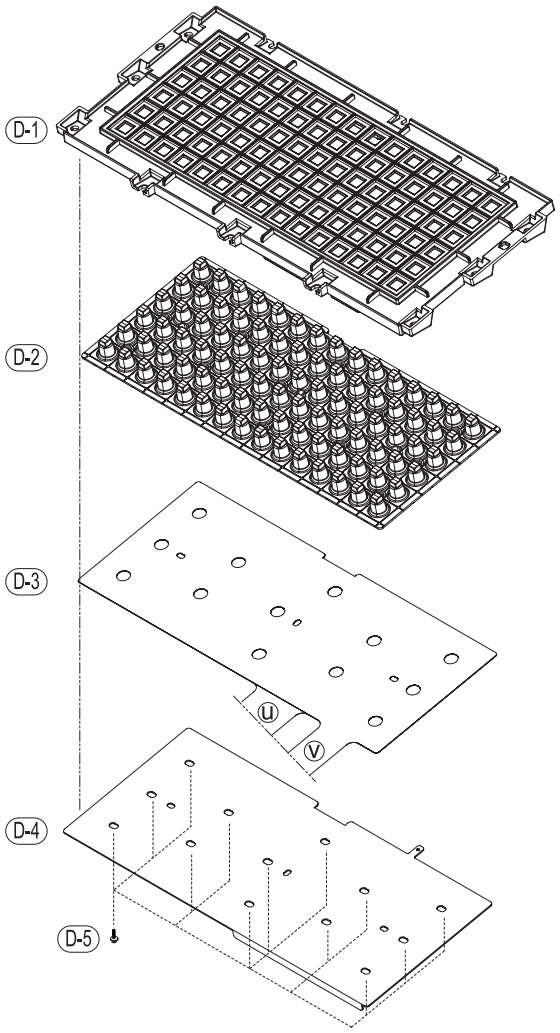


Figure6-6 ASS'Y KEYBOARD

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
D	JK59-30027A	UNIT-KEYBOARD	1		Y	
D-1	JK81-20049A	FRAME:90 KEY	1		N	
D-2	JK81-20049B	KEY-RUBBER:90 KEY	1		N	
D-3	JK81-20049C	FPC-ASSY:90 KEY	1		Y	
D-4	JK81-20049D	BASE-PLATE:90 KEY	1		N	
D-5	JK81-20049E	SCREW-TAPPING:M2.6X8	13		N	

6-2-5 ASS'Y CASE-LOWER

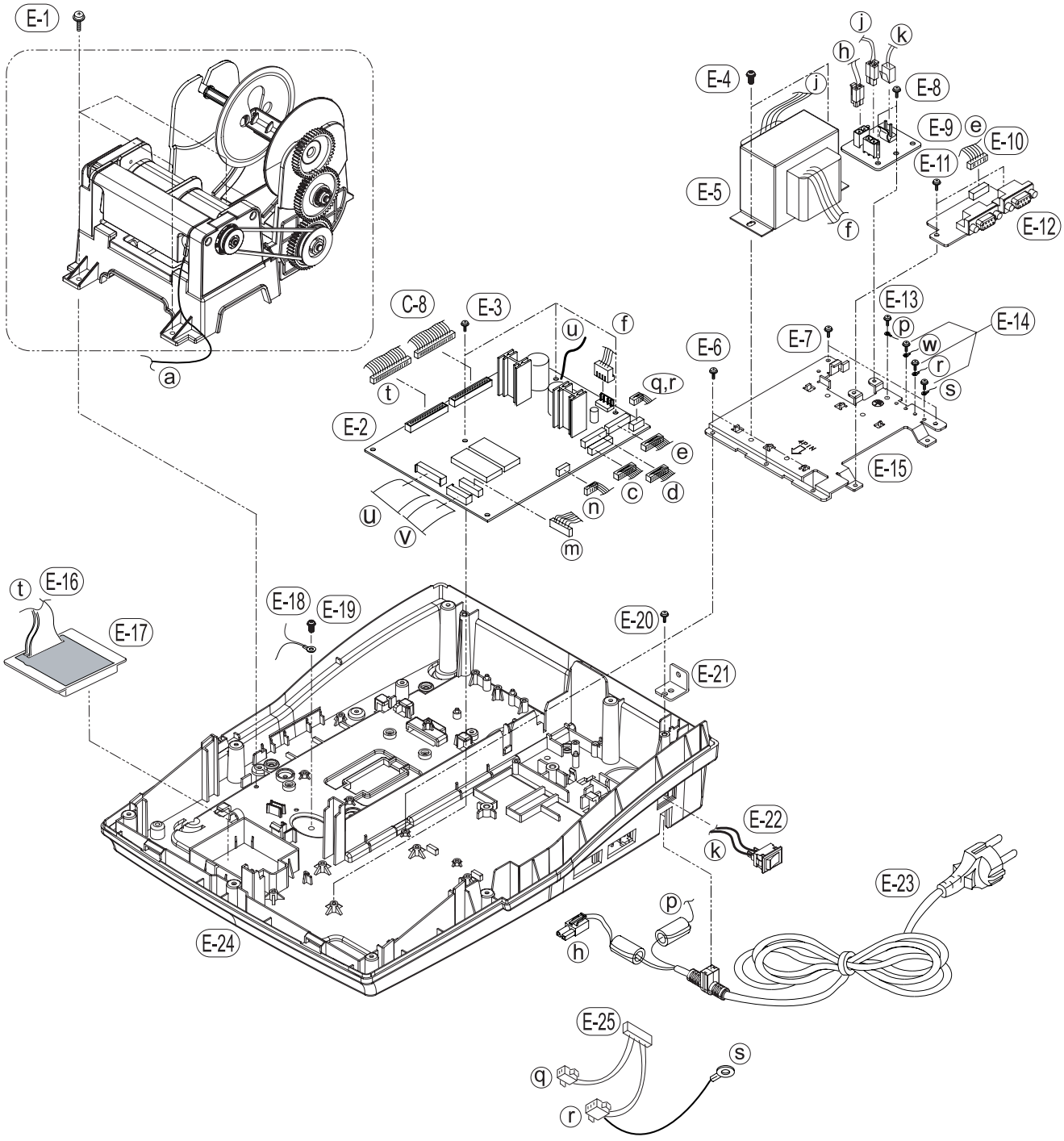


Figure 6-9 ASS'Y CASE-LOWER

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
E-1	6002-000174	SCREW-TAPPING	4		Y	
E-2	JK92-01267A	PBA-MAIN:ER-430M,LCD,2M,STD	1		Y	STD
	JK92-01267B	PBA-MAIN:ER-430M,MCR,2M,USA	1		Y	MCR
E-3	6002-000174	SCREW-TAPPING	3		Y	
E-4	6006-000199	SCREW-ASS'Y TAPTITE	2		Y	
E-5	JK26-00015A	TRANS-POWER:USA: 120V 60Hz	1		Y	
	JK26-00014A	TRANS-POWER:EUROPE: 230V 50Hz	1		Y	
E-6	6002-000175	SCREW-TAPPING	3		Y	
E-7	6002-000174	SCREW-TAPPING	2		Y	
E-8	6002-000174	SCREW-TAPPING	2		Y	
E-9	JK92-01227B	PBA SUB-POWER SW	1		Y	
E-10	JK39-40642A	HARNESS-I/F	1		Y	
E-11	6001-000666	SCREW-MACHINE	2		Y	
E-12	JK92-01280A	PBA SUB-I/F	1		Y	
E-13	6006-000199	SCREW-ASS'Y TAPTITE	1		Y	
E-14	JK60-00001A	SCREW-ASS'Y TAPTITE	3		Y	
E-15	JK70-20018B	IPR-BRKT TRANS	1		Y	
E-16	JK92-01294A	PBA SUB-FISCAL:ER-420F,1MBITs	1		Y	FISCAL
	JK92-01293A	PBA SUB-FISCAL:ER-420F,2MBITs	1		Y	FISCAL
E-17	JK72-40205A	PMO-CASE FISICAL BOARD	1		Y	FISCAL
E-18	JK39-40671A	CBF-HARNESS GND	1		Y	
E-19	6003-001149	SCREW-TAPTITE	1		Y	
E-20	6002-000171	SCREW-TAPPING	1		Y	
E-21	JK70-10002A	IPR-BRKT CASING	1		Y	
E-22	JK39-00008B	CBF-HARNESS POWER S/W	1		Y	
E-23	JK39-10002A	CBF-POWER CORD: AUSTRALIA	1		Y	
	JK39-10003A	CBF-POWER CORD: USA	1		Y	
	JK39-10008A	CBF-POWER CORD: UK	1		Y	
	JK39-10501A	CBF-POWER CORD: EUROPE	1		Y	
E-24	JK72-20182A	PMO-CASE LOWER:S1(TEAR OFF)	1		Y	
	JK72-20182B	PMO-CASE LOWER:S1,POWER	1		Y	
	JK72-20182C	PMO-CASE LOWER:S2,POWER	1		Y	
	JK72-20182D	PMO-CASE LOWER:S3,POWER	1		Y	
	JK72-20182E	PMO-CASE LOWER:POWER	1		Y	
	JK72-20182F	PMO-CASE LOWER:NON	1		Y	
E-25	JK39-40603A	HARNESS-DRA/COMP	1		Y	

6-2-6 ASS'Y-DRAWER

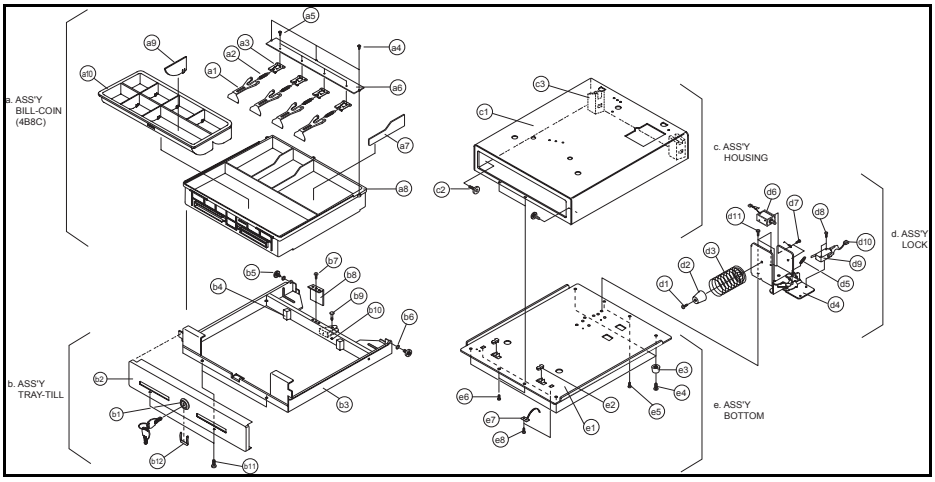


Figure 6-10 ASS'Y-DRAWER (4B/8C)

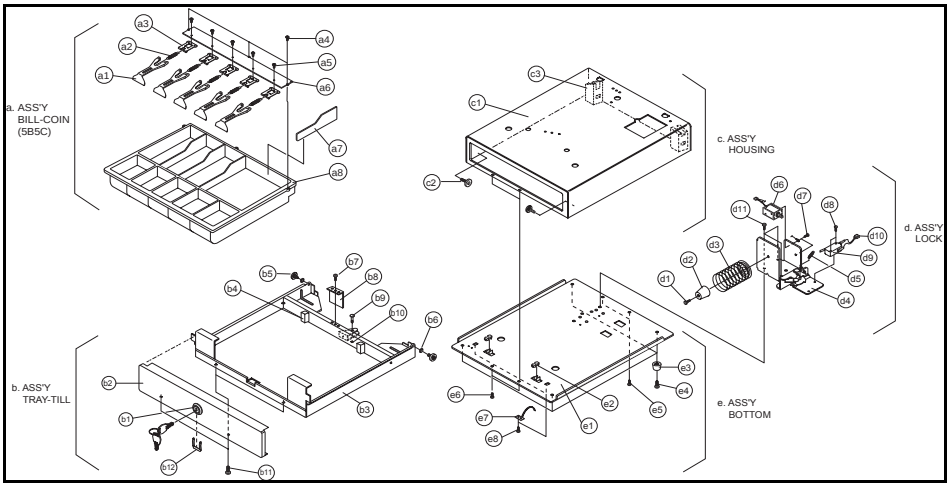


Figure 6-11 ASS'Y-DRAWER (5B/5C)

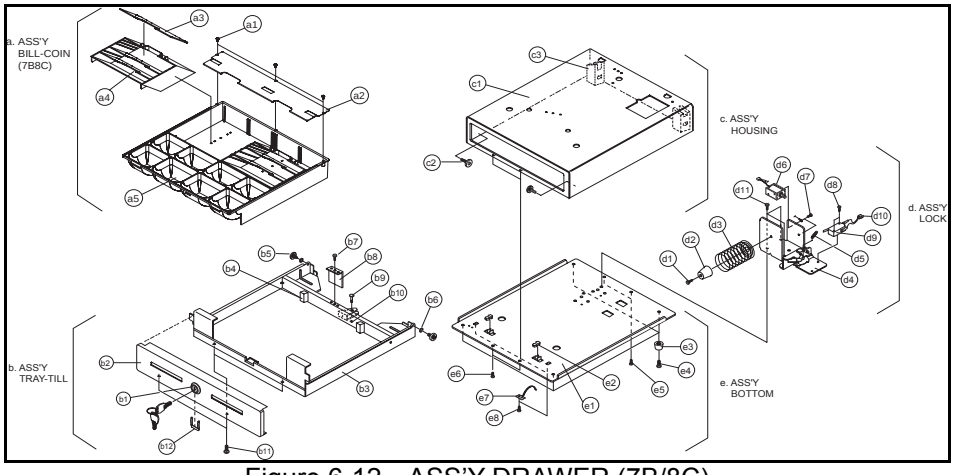


Figure 6-12 ASS'Y-DRAWER (7B/8C)

6-2-6-1 ASS'Y BILL-COIN (4B/8C, 5B/5C)

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
a	JK97-20014A	MEA-UNIT BILL COIN: A-TYPE, 4B8C	1		Y	
	JK97-00407A	MEA-UNIT BILL COIN: A-TYPE, 5B5C	1		Y	
a-1	JK72-40267A	PMO-LEVER PRESS: A-TYPE	4		Y	
a-2	6107-000134	SPRING ES	4		Y	
a-3	JK70-10314A	IPR-HOLDER LEVER: A-TYPE	4		Y	
a-4	6002-000175	SCREW-TAPPING: PWH,+2,M3,L8,ZPC(YEL)	3		Y	
a-5	6002-001078	SCREW-TAPPING: PWH,+2,M3,L5	4		Y	
a-6	JK70-10304A	IPR-PLATE HOLDER: A-TYPE	1		Y	
a-7	JK72-40269A	PMO-PANEL PARTITION: A-TYPE	3		Y	
a-8	JK72-20088A	PMO-BILL COIN TILL: A-TYPE,4B8C	1		Y	
	JK72-40268A	PMO-BILL COIN TILL: A-TYPE,5B5C	1		Y	
a-9	JK72-20090A	PMO-COIN PARTITION: A-TYPE,4B8C	6		Y	
a-10	JK72-20089A	PMO-COIN TILL: A-TYPE,4B8C,-	1		Y	

6-2-6-2 ASS'Y BILL-COIN (7B/8C)

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
a	JK97-01103A	MEA-UNIT BILL COIN: A-TYPE, 7B8C	1		Y	
a-1	6002-000175	SCREW-TAPPING: PWH,+2,M3,L8,ZPC(YEL)	3		Y	
a-2	JK70-00068A	IPR-HOLDER PLATE: A-TYPE	1		Y	
a-3	JK72-00083A	PMO-BILL PARTITION: A-TYPE	5		Y	
a-4	JK72-00082A	PMO-BILL TILL: A-TYPE	2		Y	
a-5	JK72-00084A	PMO-BILL COIN TILL: A-TYPE	1		Y	

6-2-6-3 ASS'Y TRAY-TILL

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
b	JK97-01073B	MEA-UNIT TRAY TILL: A-TYPE,5B5C	1		N	
	JK97-01073D	MEA-UNIT TRAY TILL: A-TYPE,4B8C,7B8C(EURO)	1		N	
b-1	JK75-10389A	MEC-LOCK: DRAWER	1		Y	
b-2	JK70-10014A	IPR-PLATE FRONT: A-TYPE	1		Y	
	JK70-10014B	IPR-PLATE FRONT: A-TYPE	1		Y	
b-3	JK75-00025A	MEA-TRAY TILL: A-TYPE,4B8C,7B8C	1		N	
	JK75-00025B	MEA-TRAY TILL: A-TYPE,5B5C	1		N	
b-4	JK73-10203A	RPR-TENSION: DRAWER	2		N	
b-5	JK75-10386A	MEC-ROLLER: DRAWER,DR-10-B1/ Φ19	2		Y	
b-6	6031-000549	WASHER-PLAIN: IDΦ6.5,ODΦ13, T1.0	2		Y	
b-7	6003-000221	SCREW-TAPTITE: PWH,+2,M4,L8,ZPC(YEL)	1		Y	
b-8	JK70-10324A	IPR-SUPPORT TRAY: DRAWER	1		N	
b-9	JK70-40302A	ICT,SHAFT PIN: A-TYPE	1		N	
b-10	6044-000124	RING-E: IDΦ3,ODΦ7, T0.6,ZPC(BLK),STSC	1		Y	
b-11	6002-001042	SCREW-TAPPING: FH,+2,M3,L6	2		Y	
b-12	JK70-10323A	IPR-PLATE CLIP	1		Y	

6-2-6-4 ASS'Y HOUSING

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
c	JK97-01074A	MEA-COVER HOUSING: A-TYPE,BASIC	1		N	
	JK97-01074B	MEA-COVER HOUSING: A-TYPE,NONE HOLE,OPTION	1		N	
c-1	JK75-00026A	MEA-SUB HOUSING: A-TYPE,BASIC	1		N	
	JK75-00026B	MEA-SUB HOUSING: A-TYPE,NONE HOLE,OPTION	1		N	
c-2	JK75-10386A	MEC-ROLLER: DRAWER,DR-10-B1/ Φ19	2		Y	
c-3	JK73-20207A	REX-PAD DRAWER: DRAWER	2		N	

6-2-6-5 ASS'Y LOCK

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
d	JK97-00985A	MEA-UNIT LOCK: A-TYPE,2-LATCH,LONG LEVER	1		Y	
	JK97-00987A	MEA-UNIT LOCK: A-TYPE,2-LATCH,SHORT LEVER	1		Y	
d-1	6002-000157	SCREW-TAPPING: PH,+2,M4,L14,ZPC(YEL)	1		Y	
d-2	JK73-20210A	REX-BUMPER: DRAWER	1		Y	
d-3	JK61-70100A	SPRING-PUSH: DRAWER	1		Y	
d-4	JK75-00027A	MEC-LOCK LEVER: A-TYPE,2-LATCH,LONG LEVER	1		N	
	JK75-00027B	MEC-LOCK LEVER: A-TYPE,2-LATCH,SHORT LEVER	1		N	
d-5	6107-001041	SPRING-ES: Φ0.4,D4.8,L18	1		Y	
d-6	JK33-10500A	SOLENOID-DC: A-DRAWER	1		Y	
d-7	6001-000131	SCREW-MACHINE: BH,+2,M3,L6,ZPC(YEL)	2		Y	
d-8	6001-000525	SCREW-MACHINE: PH,+2,M3,L14,ZPC(YEL)	2		Y	
d-9	3405-001013	SWITCH-MICRO: 125V,5A	1		Y	
d-10	JK39-40301R	CBF-HARNESS: 2P,150MM,BRN,1007	1		Y	
d-11	6003-000221	SCREW-TAPTITE: PWH,S,M4,L8,ZPC(YEL)	3		Y	

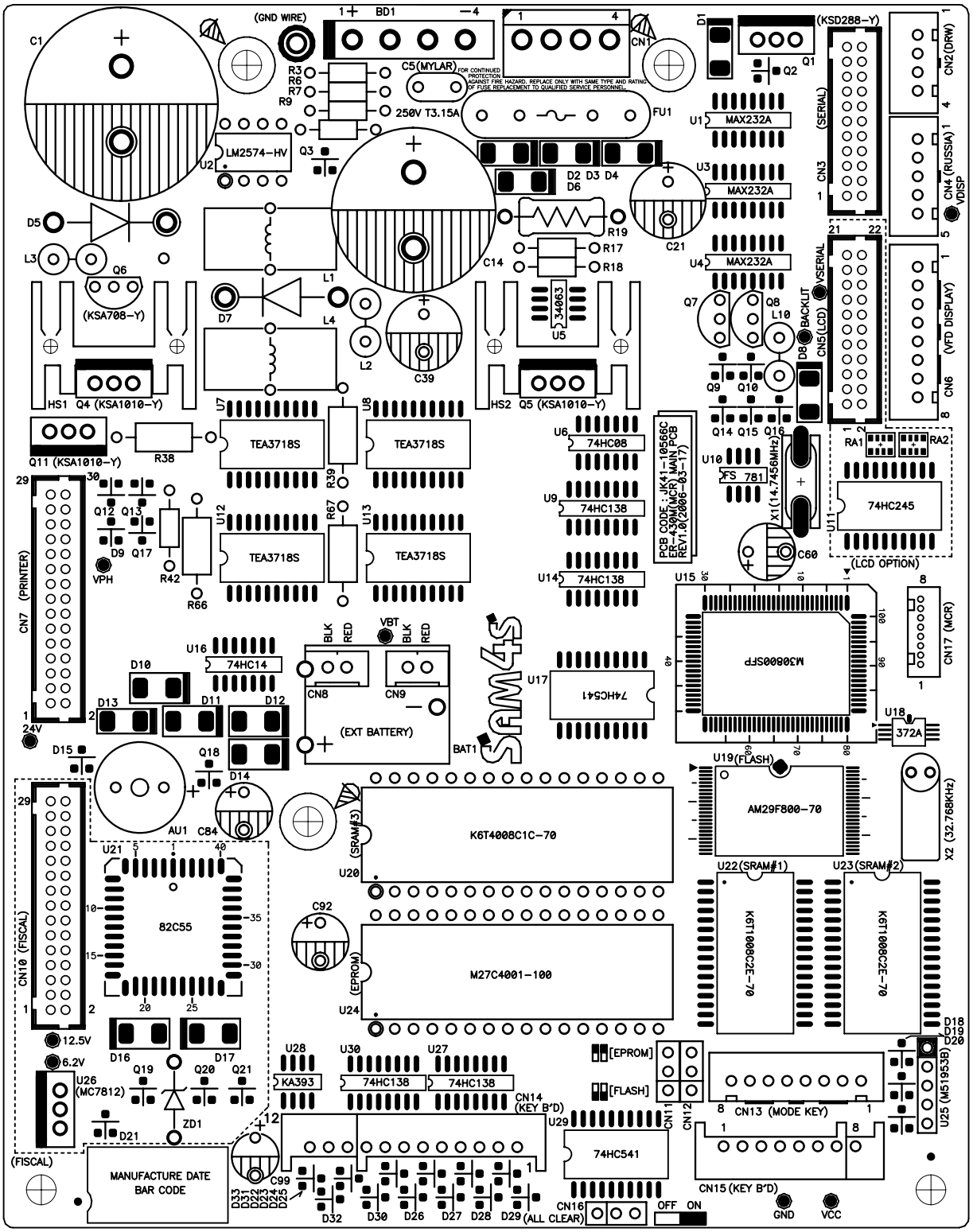
6-2-6-6 ASS'Y BOTTOM

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
e	JK97-01076A	MEA-UNIT BOTTOM: A-TYPE	1		N	
	JK97-01076B	MEA-UNIT BOTTOM: A-TYPE,UNIVERSAL	1		N	
e-1	JK70-10938A	IPR-PLATE BOTTOM: A-TYPE	1		N	
e-2	JK73-40200A	RMO-STOPPER: DRAWER	2		Y	
	JK73-10902A	RMO-STOPPER: DRAWER,UNIVERSAL	2		Y	
e-3	JK61-40200A	RMO-FOOT RUBBER: DRAWER	4		Y	
e-4	6002-000234	SCREW-TAPPING: TH,+2,M4,L16,ZPC(YEL)	4		Y	
e-5	6003-000267	SCREW-TAPTITE: PWH,+2,M3,L8,ZPC(YEL)	6		Y	
e-6	6003-000267	SCREW-TAPTITE: PWH,+2,M3,L8,ZPC(YEL)	2		Y	
e-7	JK70-10401A	IPR-PLATE SPRING: DRAWER	2		Y	
e-8	6003-000267	SCREW-TAPTITE: PWH,+2,M3,L8,ZPC(YEL)	2		Y	

MEMO

7 PCB Layout and Parts List

7-1 Main PCB Layout

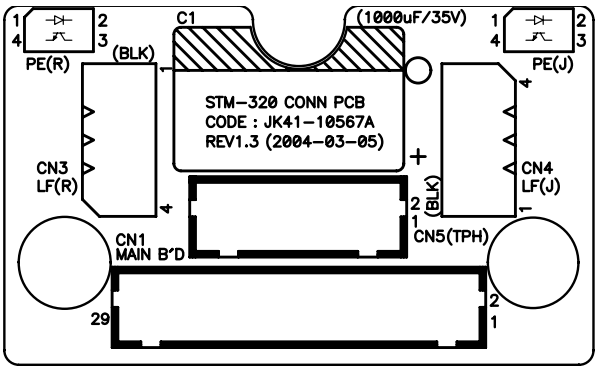


No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01267A	PBA MAIN-BD:ER-430M,232*2,2M,90KEY	1	ASS'Y	Y	STD
-	JK92-01267B	PBA MAIN-BD:ER-430M,232*2,2M,90KEY,MCR	1	ASS'Y	Y	MCR
-	0402-000168	DIODE-RECTIFIER:1N5822,40V,3A,DO-201AD,T	2	D5,D7	Y	
-	0402-000290	DIODE-BRIDGE:KBU6B,100V,6A,-,BK	1	BD1	Y	
-	0403-000141	DIODE-ZENER:1N4735A,6.2V,5%,1W,DO-41,TP	1	ZD1	Y	
-	0501-000294	TR-SMALL SIGNAL:KSA708-Y,PNP,800mW,TO-92	3	Q6,Q7,Q8	Y	
-	0502-000234	TR-POWER:KSA1010Y,PNP,40W,TO-220,TP,100	3	Q4,Q5,Q11	Y	
-	0502-000288	TR-POWER:KSD288,NPN,25W,TO-220,-,120-24	1	Q1	Y	
-	1102-000161	IC-EPROM:27C040,512Kx8BIT,DIP,32P,600MI	1	U24	Y	
-	1106-000245	IC-SRAM:684000,512Kx8BIT,DIP,32P,600MI	1	U20	Y	
-	1203-000392	IC-REGULATOR:LM2574HVN-ADJ,DIP,8P,250MIL	1	U2	Y	
-	1203-000442	IC-POSI.FIXED REG.:7812,TO-220,3P,-,PLAS	1	U26	Y	
-	1209-001089	IC-DETECTOR:M51953B,SIP,5P,-,PLASTIC,18V	1	U25	Y	
-	2001-000034	R-CARBON:220OHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R16	Y	
-	2001-000042	R-CARBON:1KOHM,5%,1/4W,AA,TP,2.4X6.4MM	2	R17,R18	Y	
-	2001-000588	R-CARBON:3.3KOHM,5%,1/4W,AA,TP,2.4X6.4MM	5	R3,R6,R7,R9,R42	Y	
-	2001-001291	R-CARBON: 1OHM,5%,1/2W,AA,TP,3.5X9.5MM	1	R27	Y	
-	2001-001292	R-CARBON:0.5OHM,5%,1/2W	4	R38,R39,R66,R67	Y	
-	2005-001001	R-WIRE WOUND:0.1ohm,5%,1W,AA,TP,3.3x9mm	1	R19	Y	
-	2301-000010	C-FILM,PEF:100nF,5%,100V,TP,11.5x12.5mm,	1	C5	Y	
-	2401-000032	C-AL:100uF,20%,50V,GP,TP,8x12,5mm	1	C21	Y	
-	2401-000042	C-AL:100uF,20%,16V,GP,TP,6.3x7,5	3	C60,C84,C92	Y	
-	2401-000132	C-AL:1000uF,35V,20%,SHL35VB1000,12.5x20m	1	C54	Y	
-	2401-001313	C-AL:4700uF,20%,50V,LUG,φ25.4*30L,RoHS	1	C1	Y	
-	2401-001363	C-AL:470uF,20%,16V,GP,TP,10x12.5,5	1	C39	Y	
-	2401-002075	C-AL:4.7uF,20%,50V,GP,TP,5x11,5	1	C99	Y	
-	2401-001321	C-AL:4700uF,35V,RADIAL,φ22*30L,RoHS,	1	C14	Y	
-	2801-003376	CRYSTAL-UNIT:0.032768MHz,20ppm,28-AAY,12	1	X2	Y	
-	3002-001027	BUZZER-PIEZO:85dB,1.5V,24mA,2.048KHz,BK	1	AU1	Y	
-	3301-000344	CORE-FERRITE BEAD:AA,-,3.5x0.6x6.5mm,-,-	2	L2,L3	Y	
-	3601-000261	FUSE-CARTRIDGE:250V,3.15A,TIME-LAG,GLASS	1	FU1	Y	
-	3602-000001	FUSE-CLIP:-,-,30mohm	2	FU1	Y	
-	3704-000255	SOCKET-IC:32P,DIP,SN,2.54mm	2	U20,U24	Y	
-	3708-000147	CONNECTOR-FFC:12P,1R,2.54mm,ST,BLACK	1	CN14	Y	
-	3708-000327	CONNECTOR-FFC:8P,1R,2.54mm,ST,BLACK	1	CN15	Y	
-	3710-000111	CONNECTOR-SHUNT:2P,1R,2.54mm,-,AUF	3	CN11,CN12,CN16	Y	
-	3711-000242	CONNECTOR-HEADER:1WALL,4P,1R,3.96mm,STRA	1	CN1	Y	
-	3711-000840	CONNECTOR-HEADER:BOX,30P,2R,2MM,STRAIGHT	2	CN7,CN10	Y	
-	3711-001475	CONNECTOR-HEADER:NOWALL,3P,1R,2.54mm,STR	3	CN11,CN12,CN16	Y	
-	3711-002002	CONNECTOR-HEADER:-,22P,2R,2mm,STRAIGHT,S	2	CN3,CN5	Y	
-	3711-004105	WAFER;BOX-HEADER,1R,4P,2.5mm,STRAIGHT	1	CN2	Y	
-	3711-004107	WAFER;BOX-HEADER,1R,5P,2.5mm,STRAIGHT	1	CN4	Y	
-	3711-004109	WAFER;BOX-HEADER,1R,8P,2.5mm,STRAIGHT	1	CN13	Y	
-	3711-004110	WAFER;BOX-HEADER,1R,8P,2.5mm,STRAIGHT,RED	1	CN6	Y	
-	4302-000126	BATTERY-NICD(2ND):3.6V(1.2Vx3),60mAH,CYL	1	BAT1	Y	
-	6203-000107	HEAT SINK:NONE,T2,W17,L22,H45,DEGRE,AL60	2	HS1(Q4), HS2(Q5)	Y	
-	JK27-60100D	COIL FILTER:ER-350,140 UH,-,-	2	L1,L4	Y	
-	0401-001003	DIODE-SWITCHING:MMBD6050LT1,70V,200mA,22	14	D9,D15,D18,D19,D20,D21, D22,D23,D24,D25,D26,D27 D28,D29	Y	
-	0402-001189	DIODE-RECTIFIER:M4,400V,1A,SMD-2,TP	7	D1,D2,D3,D4,D6,D8 D13	Y	
-	0404-001051	DIODE-SCHOTTKY:SK14,40V,1000MA,DO-214AA,	6	D10,D11,D12,D14,D16,D17	Y	
-	0501-000279	TR-SMALL SIGNAL:KSA1182-Y,PNP,150mW,SOT-	5	Q10,Q12,Q15,Q16, Q19	Y	
-	0501-000457	TR-SMALL SIGNAL:MMBT2222A,NPN,350MW,SOT-	9	Q2,Q3,Q9,Q13,Q14,Q17, Q18,Q20,Q21	Y	
-	0801-000523	IC-CMOS LOGIC:74HCT541,BUFFER/DRIVER,SOP	2	U17,U29	Y	
-	0801-000642	IC-CMOS LOGIC:74HC138,3-TO-8 DECODER,SOP	4	U9,U14,U27,U30	Y	
-	0801-000696	IC-CMOS LOGIC:74HC245,TRANSCEIVER,SOP,20	1	U11	Y	

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	0801-000887	IC-CMOS LOGIC:74HCT08,AND GATE,SOP,14P,1	1	U6	Y	
-	0801-001090	IC-CMOS LOGIC:74HC14,SCHIMITT INVERTER,S	1	U16	Y	
-	0903-001155	IC-MICROCOMPUTER:30800SFP,16BIT,QFP,100P	1	U15	Y	
-	0904-000411	IC-PERIPHERAL:82C55,8BIT,PLCC,44P	1	U21	Y	
-	0909-000137	IC-REAL TIME CLOCK:RS5C372A,SSOP,8P	1	U18	Y	
-	1003-001235	IC-MOTOR DRIVER:TEA3718,SOP,20P,50MIL	4	U7,U8,U12,U13	Y	
-	1006-000133	IC-DRIVER/RECEIVER:232,SOP,16P,150MIL,DU	3	U1,U3,U4	Y	
-	1106-000131	IC-SRAM:681000,128Kx8BIT,SOP,32P,525MI	2	U22,U23	Y	
-	1107-001121	IC-FLASH MEMORY:29F800,1Mx8/512Kx16Bit,T	1	U19	Y	
-	1202-000164	IC-VOLTAGE COMP.:393,SOP,8P,150MIL,DUAL,	1	U28	Y	
-	1203-000404	IC-DC/DC CONVERTER:34063,SOP,8P,150MIL,P	1	U5	Y	
-	1205-001771	IC-CLOCK GENERATOR:FS781BZB,SOP,8PIN	1	U10	Y	
-	2007-000001	R-CHIP:68KOHM,5%,1/10W,DA,TP,2012	2	R91,R96	N	
-	2007-000026	R-CHIP:200OHM,5%,1/10W,DA,TP,2012	1	R57	N	
-	2007-000028	R-CHIP:39OHM,5%,1/10W,DA,TP,2012	13	R113,R136,R137,R138, R139,R141,R142,R143 R144,R147,R148,R149,R150	N	
-	2007-000030	R-CHIP:560OHM,5%,1/10W,DA,TP,2012	3	R22,R24,R40	N	
-	2007-000290	R-CHIP:100OHM,5%,1/10W,DA,TP,2012	12	R2,R20,R65,R77,R78,R83, R86,R92,R99,R102,R104, R106	N	
-	2007-000300	R-CHIP:10KOHM,5%,1/10W,DA,TP,2012	1	R1,R4,R25,R30,R43,R44,R45 R47,R50,R59,R61,R64,R68 R70,R81,R82,R84,R85,R87 R97,R107,R108,R115,R119 R133	N	
-	2007-000352	R-CHIP:12KOHM,1%,1/10W,DA,TP,2012	1	R28	N	
-	2007-000395	R-CHIP:150KOHM,5%,1/10W,DA,TP,2012	4	R56,R79,R88,R93	N	
-	2007-000406	R-CHIP:15KOHM,1%,1/10W,DA,TP,2012	1	R80	N	
-	2007-000457	R-CHIP:18KOHM,5%,1/10W,DA,TP,2012	7	R8,R10,R35,R51,R58 R121,R128	N	
-	2007-000468	R-CHIP:1KOHM,5%,1/10W,DA,TP,2012	9	R12,R31,R41,R48,R49 R52,R71,R72,R127	N	
-	2007-000642	R-CHIP:270OHM,5%,1/10W,DA,TP,2012	3	R95,R98,R100	N	
-	2007-000653	R-CHIP:27KOHM,5%,1/10W,DA,TP,2012	2	R15,R34	N	
-	2007-000671	R-CHIP:2KOHM,5%,1/10W,DA,TP,2012	2	R11,R117	N	
-	2007-000686	R-CHIP:3.3KOHM,5%,1/10W,DA,TP,2012	3	R21,R46,R60	N	
-	2007-000872	R-CHIP:4.7KOHM,5%,1/10W,DA,TP,2012	27	R5,R23,R26,R32,R33,R36,R6 3,R69,R94,R101,R103,R105, R116,R120,R129,R131,R132, R134,R135,R110,R111,R112, R122,R123,R124,R125,R140	N	
-	2007-000931	R-CHIP:470OHM,5%,1/10W,DA,TP,2012	11	R14,R16,R27,R37,R114,R118, R126,R130,R95,R100,R31	N	
-	2007-001039	R-CHIP:56KOHM,5%,1/10W,DA,TP,2012	4	R53,R54,R74,R75	N	
-	2007-001071	R-CHIP:6.8KOHM,5%,1/10W,DA,TP,2012	3	R55,R62,R109	N	
-	2007-001662	R-CHIP:36KOHM,1%,1/10W,DA,TP,2012	2	R13,R29,	N	
-	2011-001093	R-NETWORK:100ohm,5%,1/16W,L,CHIP,8P,TP	2	RA1,RA2	N	
-	2203-000192	C-CERAMIC,CHIP:100nF,+80-20%,50V,Y5V,TP,	42	C2,C7,C10,C24,C31,C32,C40, C41,C42,C43,C44,C45,C50, C51,C53,C59,C61,C62,C63, C72,C74,C79,C82,C83,C85, C86,C87,C88,C89,C90,C91, C93,C94,C95,C96,C97,C98, C100,C101,C102,C103,C105	N	
-	2203-000239	C-CERAMIC,CHIP:0.1nF,5%,50V,NP0,TP,2012	10	C36,C55,C58,C64,C71,C76, C77,C78,C80,C81	N	
-	2203-000260	C-CERAMIC,CHIP:10nF,10%,50V,X7R,TP,2012	2	C73,C75	N	
-	2203-000595	C-CERAMIC,CHIP:0.22nF,5%,50V,NP0,TP,2012	1	C57	N	
-	2203-000634	C-CERAMIC,CHIP:0.022nF,5%,50V,NP0,TP,201	2	C52,C56	N	
-	2203-000938	C-CERAMIC,CHIP:0.47nF,5%,50V,NP0,TP,2012	12	C3,C4,C6,C9,C13,C15,C18, C19,C20,C23,C25,C28	N	
-	2203-000990	C-CERAMIC,CHIP:1uF,+80-20%,25V,Y5V,TP,20	16	C8,C11,C12,C16,C17,C22, C26,C27,C29,C30,C33,C34, C35,C37,C38,C104	N	

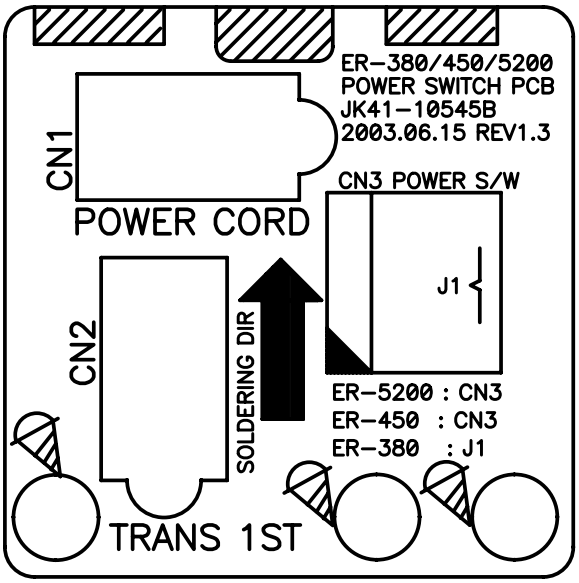
No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	2203-000991	C-CERAMIC,CHIP:0.82nF,5%,50V,NP0,TP,2012	8	C46,C47,C48,C49,C67,C68, C69,C70	N	
-	2801-003382	CRYSTAL-SMD:14.7456MHZ,SX-1,18pF	1	X1	Y	
-	3301-000317	CORE-FERRITE BEAD:AB,2x1.25x0.9mm,-,-	5	L5,L6,L7,L8,L9	N	
-	JK41-10566B	PCB-MAIN:ER-430MF,FR-4,2L,T1.6mm	1	ER-430F	N	
-	JK41-10566C	PCB-MAIN:ER-430M,FR-4,2L,T1.6mm	1	ER-430M	N	

7-2 STM-320 Printer PCB Layout



No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
	JK92-01265A	PBA SUB-CONNECTION BOARD:STM-310/320	1	ASS'Y	Y	
	3711-000961	CONNECTOR-HEADER:BOX,4P,1R,2.5mm,STRAIGHT	2	CN3,CN4	Y	
	3711-003340	CONN-HEADER:16P,2R,2mm,ST,BLK,YDW200-16	1	CN5	Y	
	3711-000840	CONNECTOR-HEADER:BOX,30P,2R,2MM,STRAIGHT	1	CN1	Y	
	0604-000158	REFLECT-SENSOR:SG-105F,4P,STM-320	2	U1,U2	Y	
	JK41-10567A	PCB-CONNECTION:STM-320,FR-4,2L,T1.6mm	1	PCB	N	
	JK39-40632A	HARNESS-CONNECTION;STM-320,16P,60mm,UL10	1	CONN B'D~TPH	Y	
	JK39-00012A	CBF-HARNESS-KEY OPTION:SPS-1000,UL1061,U	1	CONN B'D~MAIN B'D	Y	

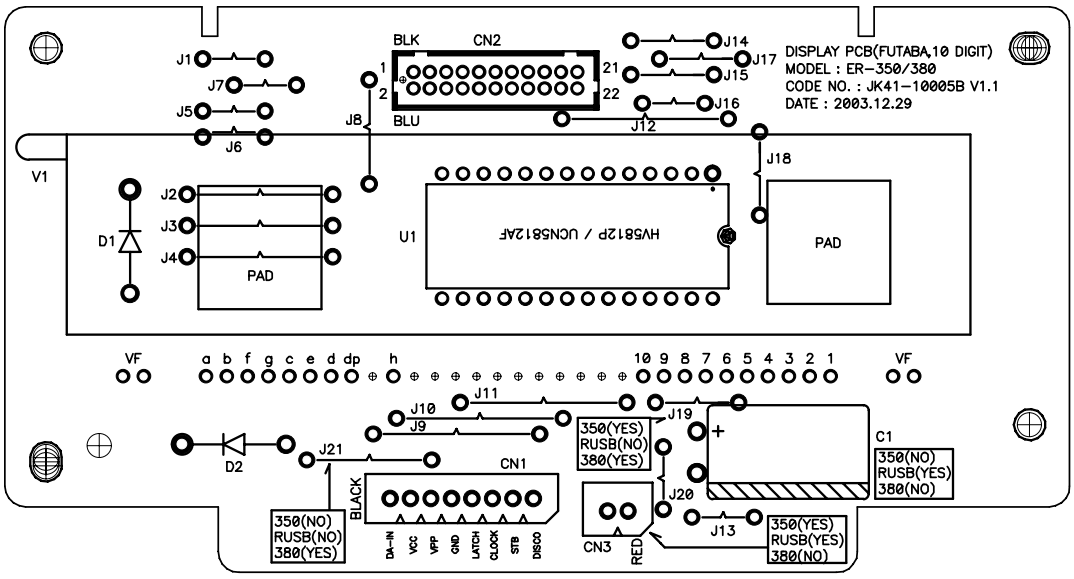
7-3 Power Switch PCB Layout



No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01227B	PBA SUB-POWER SW:ER-5200,STD	1	ASS'Y	Y	
-	3711-000190	CONNECTOR-HEADER:1WALL,2P,1R,7.92mm,STRA	1	CN3	Y	
-	3711-000829	CONNECTOR-HEADER:BOX,2P,1R,6.2mm,STRAIGH	2	CN1,CN2	Y	
-	JK41-10545B	PCB-POWER SWITCH:ER-52/5500,FR-1,1L,T1.6	1	PCB	N	

7-4 Display Layout

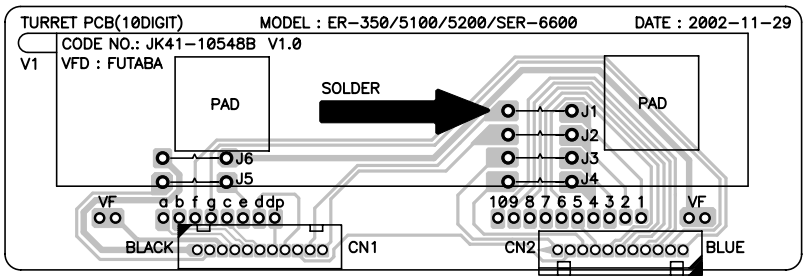
7-4-1 ER-430 Front Display (VFD 10Digit)



No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01242A	PBA SUB-380,DISPLAY:FUTABA,10G	1	ASS'Y	Y	
-	3711-004111	WAFER;BOX-HEADER,1R,8P,2.5mm,ANGLE	1	CN1	Y	
-	3711-002002	CONNECTOR-HEADER:-,22P,2R,2mm,STRAIGHT,S	1	CN2	Y	
-	JK07-00005A	DISPLAY VFD-DC10G:FUTABA,10-LT-50GK	1	V1	Y	
-	JK39-40600A	HARNESS-DISPLAY;ER-380,8P,350mm,CORE	1	HARNESS	Y	
-	JK73-10207A	RPR-PAD:ER-220N,SPONGE,-,BLK,-	2	T5.0	Y	
-	1003-001381	IC-VFD:HV5812P,DIP,28P,540MIL,-,-,ST,PLA	1	U1	Y	
-	0402-000208	DIODE-RECTIFIER:EK-04,40V,1.5A,DO-41	1	D2	Y	
-	0402-000129	DIODE-RECTIFIER:1N4003,200V,1A,DO-41,TP	1	D1	Y	
-	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	21	J1~J21	N	
-	JK41-10005B	PCB-DISPLAY(10G):ER-350/F,FR-1,1L,T1.6	1	PCB	N	

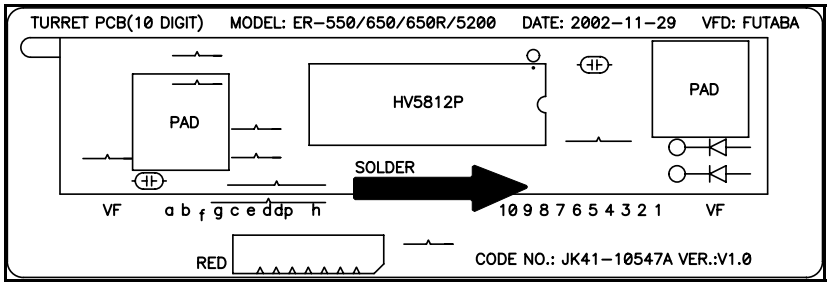
7-4 Display Layout

7-4-2 ER-420F Rear Display (VFD 10Digit)



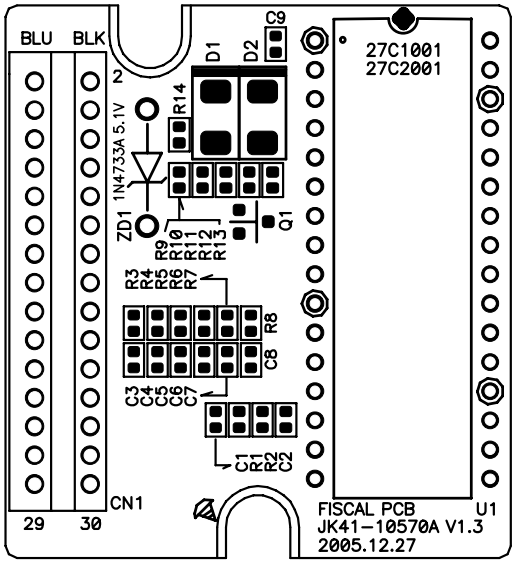
No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01231A	PBA SUB-TURRET:ER-5100/5200,STD	1	ASS'Y	Y	
-	JK39-40002A	CBF HARNESS:ER-220N,-,UL1061,400MM,BLK/R	1	DISPLAY TO MAIN	Y	
-	JK07-00005A	DISPLAY VFD-DC10G:FUTABA,10-LT-50GK	1	FUTABA VFD/10 DIGIT	Y	
-	3711-002812	CONNECTOR-HEADER:BOX,11P,1R,2mm,STRAIGHT	2	CN1,CN2	Y	
-	JK73-10207A	RPR-PAD:ER-220N,SPONGE,-,BLK,-	2	PAD	Y	
-	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	6	JP1~JP6	N	
-	JK41-10548B	PCB-TURRET:ER-5100/5200,FR-1,1L,T1.6	1	FUTABA VFD/10 DIGIT	N	

7-4-3 ER-420M Rear Display (VFD 10Digit)



No	Part -No	Description/Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-00970B	PBA SUB-TURRET:ER-450,WORLD,BASIC	1	ASS'Y	Y	
-	3711-004109	WAFER;BOX-HEADER,1R,8P,2.5mm,STRAIGHT	1	CN1	Y	WHITE
-	JK07-00005A	DISPLAY VFD-DC10G:FUTABA,10-LT-50GK	1	V1	Y	
-	JK39-40606A	HARNESS-TURRET:ER-450,8P,500mm,TUBE	1	TURR TO MAIN	Y	TUBE
-	JK73-10207A	RPR-PAD:ER-220N,SPONGE,-,BLK,-	2	T5.0	Y	
-	1003-001381	IC-VFD:HV5812P,DIP,28P,540MIL,-,-,ST,PLA	1	U1	Y	
-	0402-000129	DIODE-RECTIFIER:1N4003,200V,1A,DO-41,TP	1	D1	Y	
-	0402-000208	DIODE-RECTIFIER:EK-04,40V,1.5A,DO-41	1	D2	Y	
-	2202-000579	C-CERAMIC,MLC-AXIAL:100nF,+80-20%,50V,Z5	2	C1,C2	Y	
-	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	9	J1 ~ J9	N	
-	JK41-10547A	PCB-TURRET:ER-650/5200,FR-1,1L,T1.6	1	PCB	N	

7-5 Fiscal Layout



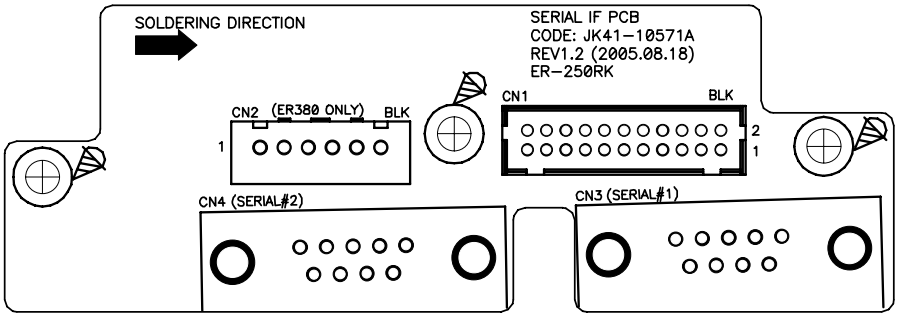
7-5-1 Part List (Memory Size = 1MBITs)

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
	JK92-01294A	PBA SUB-FISCAL:ER-420F,1M	1	ASS'Y	Y	
	1102-000109	IC-EPROM:27C010,128Kx8BIT,DIP,32P,600MI	1	U1	Y	
	0403-000525	DIODE-ZENER:1N4733A,5.1V,5%,1W,DO-41	1	ZD1	Y	
	JK39-40640A	HARNESS-FISCAL:ER-450,30P,130mm,2mm	1	CN1	Y	
	0404-001051	DIODE-SCHOTTKY:SK14,40V,1000MA,DO-214AA,	2	D1,D2	Y	
	0501-000457	TR-SMALL SIGNAL:MMBT2222A,NPN,350MW,SOT-	1	Q1	Y	
	2008-000027	R-CHIP:1.2KOHM,5%,1/10W,1608	3	R9,R10,R12	N	
	2008-000037	R-CHIP:4.7KOHM,5%,1/10W,1608	5	R1,R2,R3,R4,R5	N	
	2008-000037	R-CHIP:4.7KOHM,5%,1/10W,1608	5	R6,R7,R8,R11,R13	N	
	2008-000044	R-CHIP:10KOHM,5%,1/10W,1608	1	R14	N	
	2204-000010	C-CERAMIC,CHIP:100pF,5%,50V,1608	5	C1,C2,C3,C4,C5	N	
	2204-000010	C-CERAMIC,CHIP:100pF,5%,50V,1608	3	C6,C7,C8	N	
	2204-000028	C-CERAMIC,CHIP:100nF,+80-20%,25V,Y5V,160	1	C9	N	
	JK41-10570A	PCB-FISCAL:GREECE,2M,FR-4,2L,T1.6mm	1	PCB	N	

7-5-2 Part List (Memory Size = 2MBITs)

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
	JK92-01293A	PBA SUB-FISCAL:ER-420F,2M	1	ASS'Y	Y	
	1102-000136	IC-EPROM:27C020,256Kx8BIT,DIP,32P,150ns	1	U1	Y	
	0403-000525	DIODE-ZENER:1N4733A,5.1V,5%,1W,DO-41	1	ZD1	Y	
	JK39-40640A	HARNESS-FISCAL:ER-450,30P,130mm,2mm	1	CN1	Y	
	0404-001051	DIODE-SCHOTTKY:SK14,40V,1000MA,DO-214AA,	2	D1,D2	Y	
	0501-000457	TR-SMALL SIGNAL:MMBT2222A,NPN,350MW,SOT-	1	Q1	Y	
	2008-000027	R-CHIP:1.2KOHM,5%,1/10W,1608	3	R9,R10,R12	N	
	2008-000037	R-CHIP:4.7KOHM,5%,1/10W,1608	5	R1,R2,R3,R4,R5	N	
	2008-000037	R-CHIP:4.7KOHM,5%,1/10W,1608	5	R6,R7,R8,R11,R13	N	
	2008-000044	R-CHIP:10KOHM,5%,1/10W,1608	1	R14	N	
	2204-000010	C-CERAMIC,CHIP:100pF,5%,50V,1608	5	C1,C2,C3,C4,C5	N	
	2204-000010	C-CERAMIC,CHIP:100pF,5%,50V,1608	3	C6,C7,C8	N	
	2204-000028	C-CERAMIC,CHIP:100nF,+80-20%,25V,Y5V,160	1	C9	N	
	JK41-10570A	PCB-FISCAL:GREECE,2M,FR-4,2L,T1.6mm	1	PCB	N	

7-6 Interface Layout

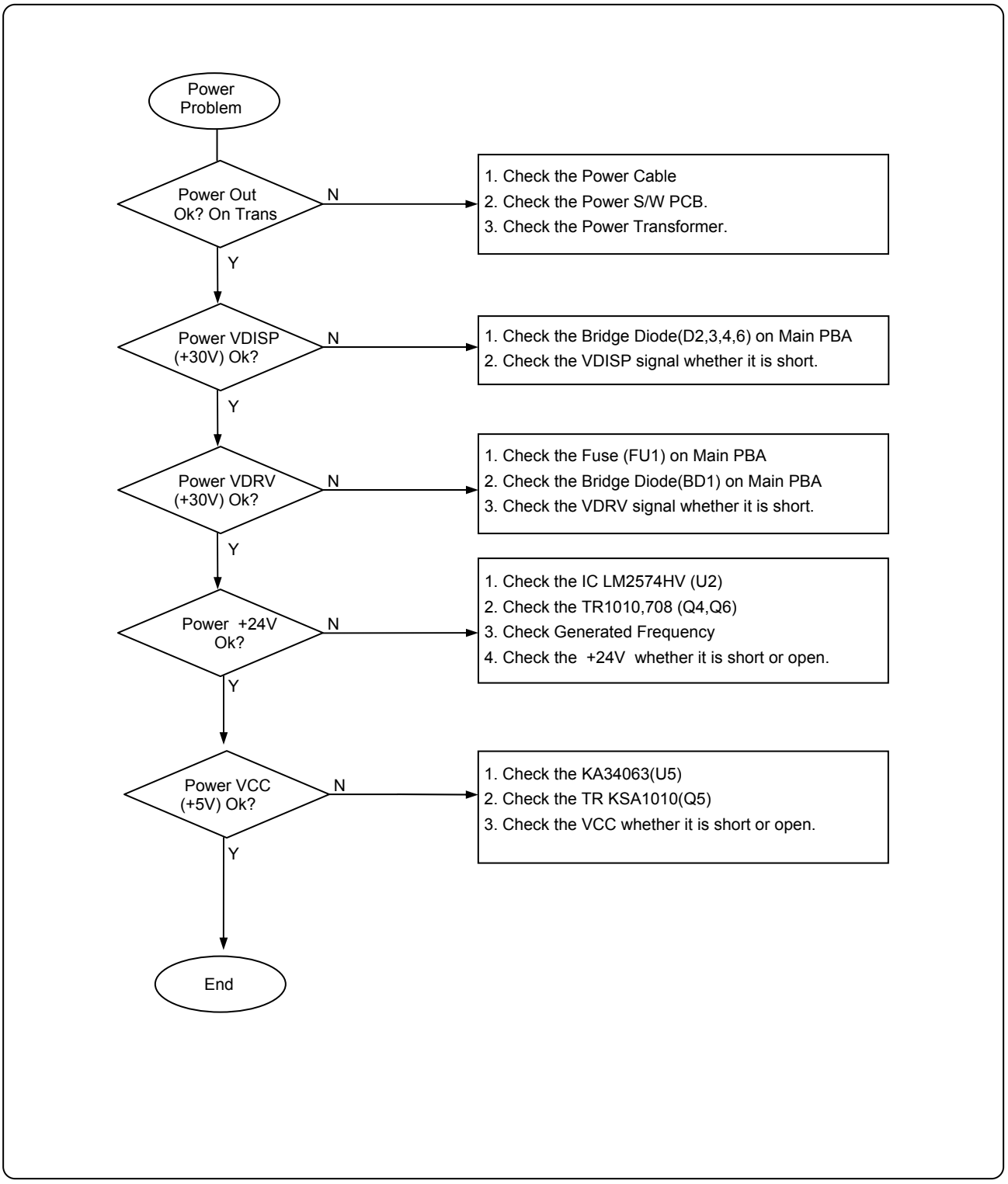


No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01280A	PBA SUB-I/F:ER-380/M,232*2	1	ASS'Y	Y	
-	3711-002002	CONNECTOR-HEADER:-,22P,2R,2mm,STRAIGHT,S	1	CN1	Y	
-	3701-000232	CONNECTOR-DSUB:9P,2R,FEMALE,ANGLE,AUF	2	CN3,CN4	Y	
-	JK41-10571A	PCB-I/F:ER-380/M,232*2,FR-4,2L,T1.6mm	1	PCB	N	

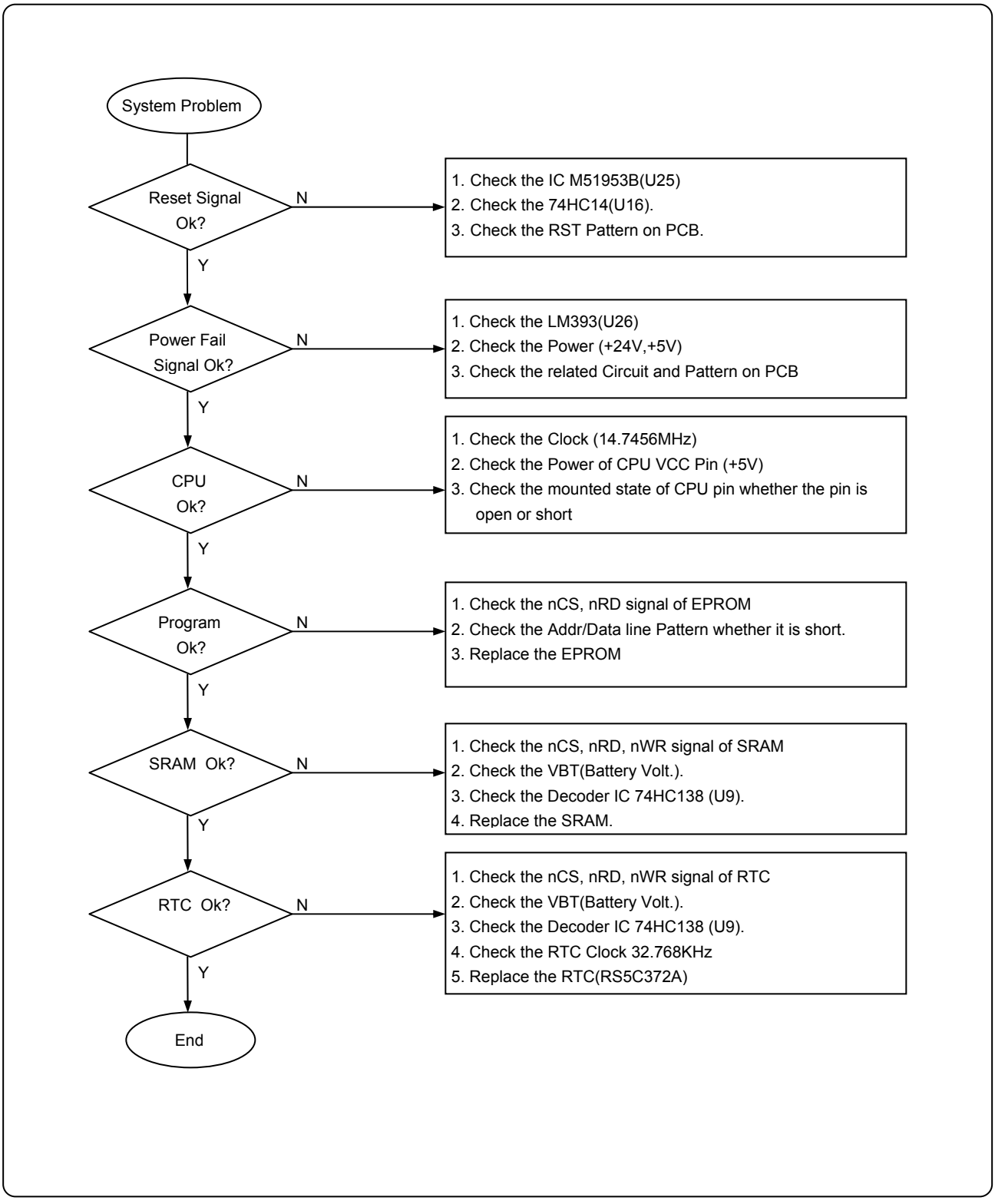
MEMO

8 Troubleshooting

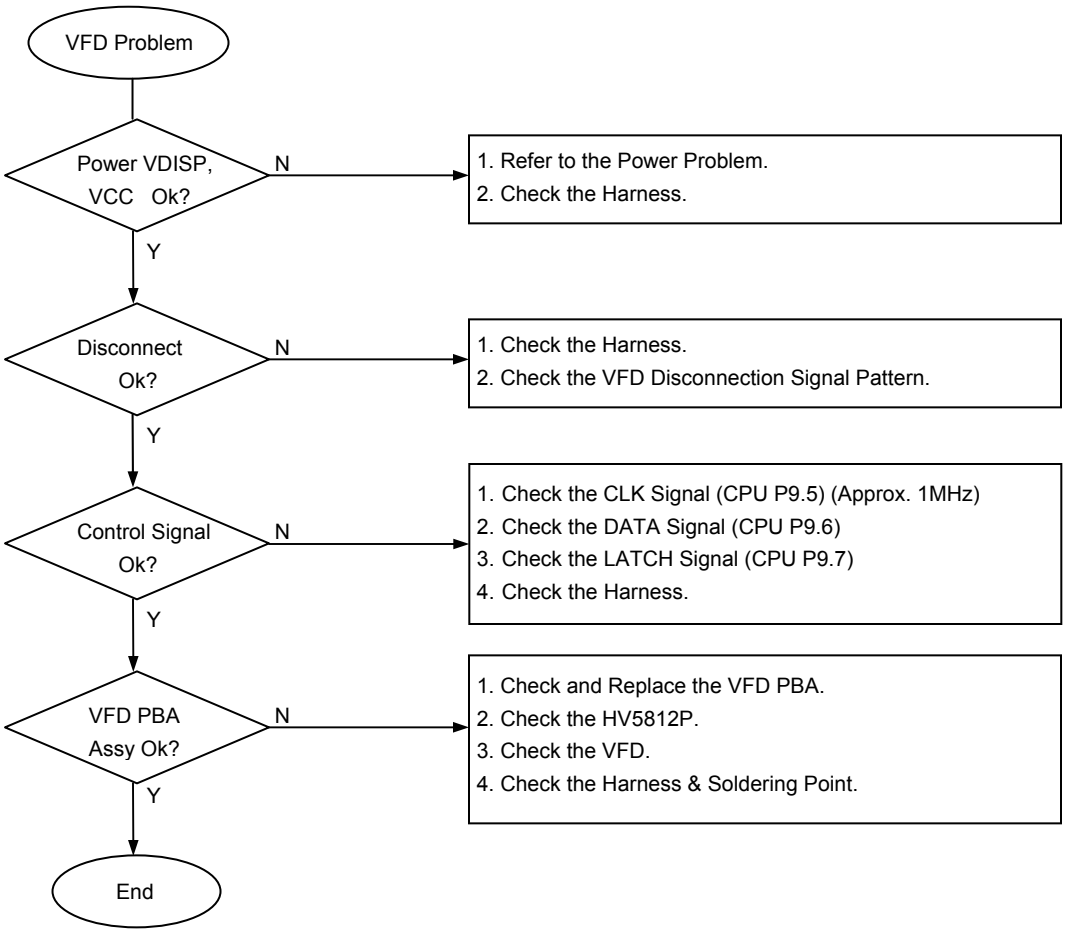
8-1 Power Problem


Power Problem
Power Out Ok? On Trans
N
1. Check the Power Cable
2. Check the Power S/W PCB.
3. Check the Power Transformer.
Y
Power VDISP (+30V) Ok?
N
1. Check the Bridge Diode(D2,3,4,6) on Main PBA
2. Check the VDISP signal whether it is short.
Y
Power VDRV (+30V) Ok?
N
1. Check the Fuse (FU1) on Main PBA
2. Check the Bridge Diode(BD1) on Main PBA
3. Check the VDRV signal whether it is short.
Y
Power +24V Ok?
N
1. Check the IC LM2574HV (U2)
2. Check the TR1010,708 (Q4,Q6)
3. Check Generated Frequency
4. Check the +24V whether it is short or open.
Y
Power VCC (+5V) Ok?
N
1. Check the KA34063(U5)
2. Check the TR KSA1010(Q5)
3. Check the VCC whether it is short or open.
Y
End

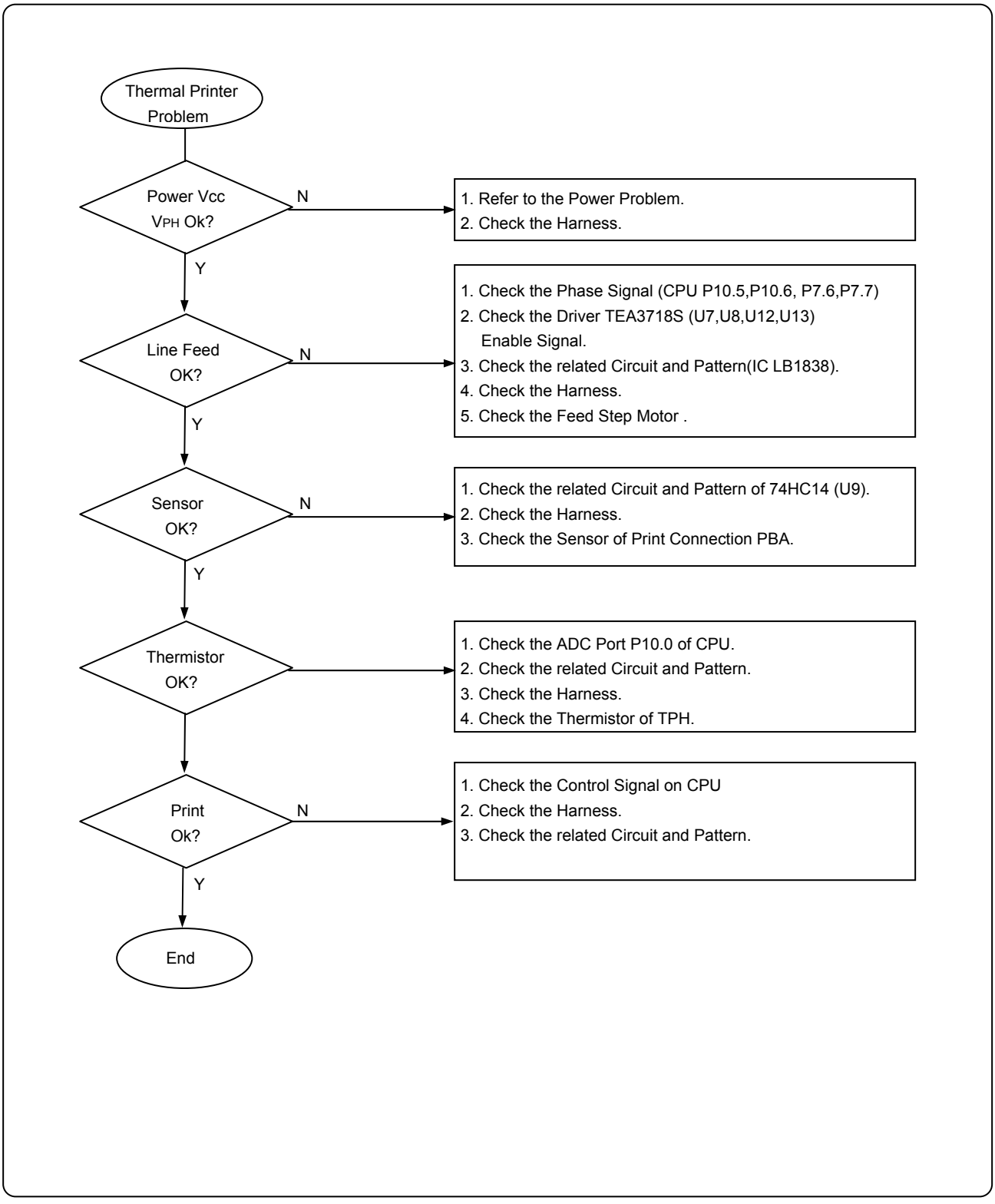
8-2 System Problem


System Problem
Reset Signal Ok?
N
1. Check the IC M51953B(U25)
2. Check the 74HC14(U16).
3. Check the RST Pattern on PCB.
Y
Power Fail Signal Ok?
N
1. Check the LM393(U26)
2. Check the Power (+24V,+5V)
3. Check the related Circuit and Pattern on PCB
Y
CPU Ok?
N
1. Check the Clock (14.7456MHz)
2. Check the Power of CPU VCC Pin (+5V)
3. Check the mounted state of CPU pin whether the pin is open or short
Y
Program Ok?
N
1. Check the nCS, nRD signal of EPROM
2. Check the Addr/Data line Pattern whether it is short.
3. Replace the EPROM
Y
SRAM Ok?
N
1. Check the nCS, nRD, nWR signal of SRAM
2. Check the VBT(Battery Volt.).
3. Check the Decoder IC 74HC138 (U9).
4. Replace the SRAM.
Y
RTC Ok?
N
1. Check the nCS, nRD, nWR signal of RTC
2. Check the VBT(Battery Volt.).
3. Check the Decoder IC 74HC138 (U9).
4. Check the RTC Clock 32.768KHz
5. Replace the RTC(RS5C372A)
Y
End

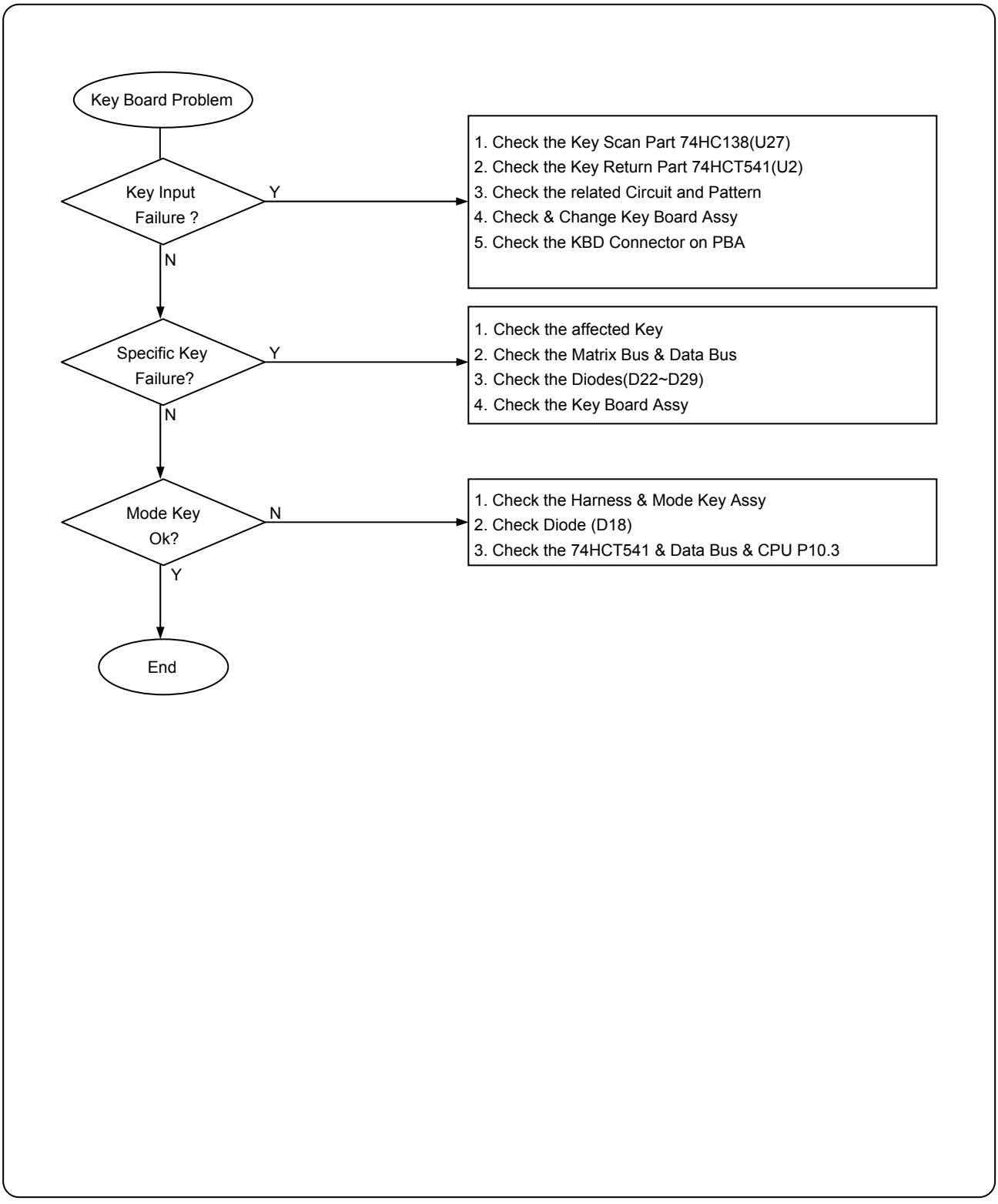
8-3 VFD Display Problem



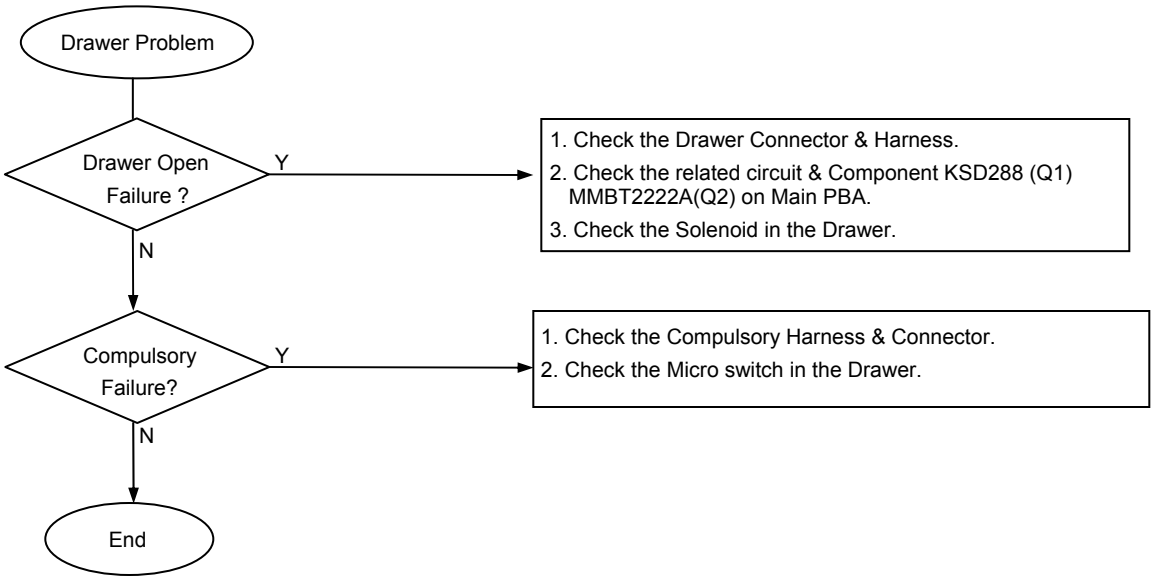
8-4 Thermal Printer Problem


Thermal Printer Problem
Power Vcc VPH Ok?
N
1. Refer to the Power Problem.
2. Check the Harness.
Y
Line Feed OK?
N
1. Check the Phase Signal (CPU P10.5,P10.6, P7.6,P7.7)
2. Check the Driver TEA3718S (U7,U8,U12,U13) Enable Signal.
3. Check the related Circuit and Pattern(IC LB1838).
4. Check the Harness.
5. Check the Feed Step Motor .
Y
Sensor OK?
N
1. Check the related Circuit and Pattern of 74HC14 (U9).
2. Check the Harness.
3. Check the Sensor of Print Connection PBA.
Y
Thermistor OK?
1. Check the ADC Port P10.0 of CPU.
2. Check the related Circuit and Pattern.
3. Check the Harness.
4. Check the Thermistor of TPH.
Print Ok?
N
1. Check the Control Signal on CPU
2. Check the Harness.
3. Check the related Circuit and Pattern.
Y
End

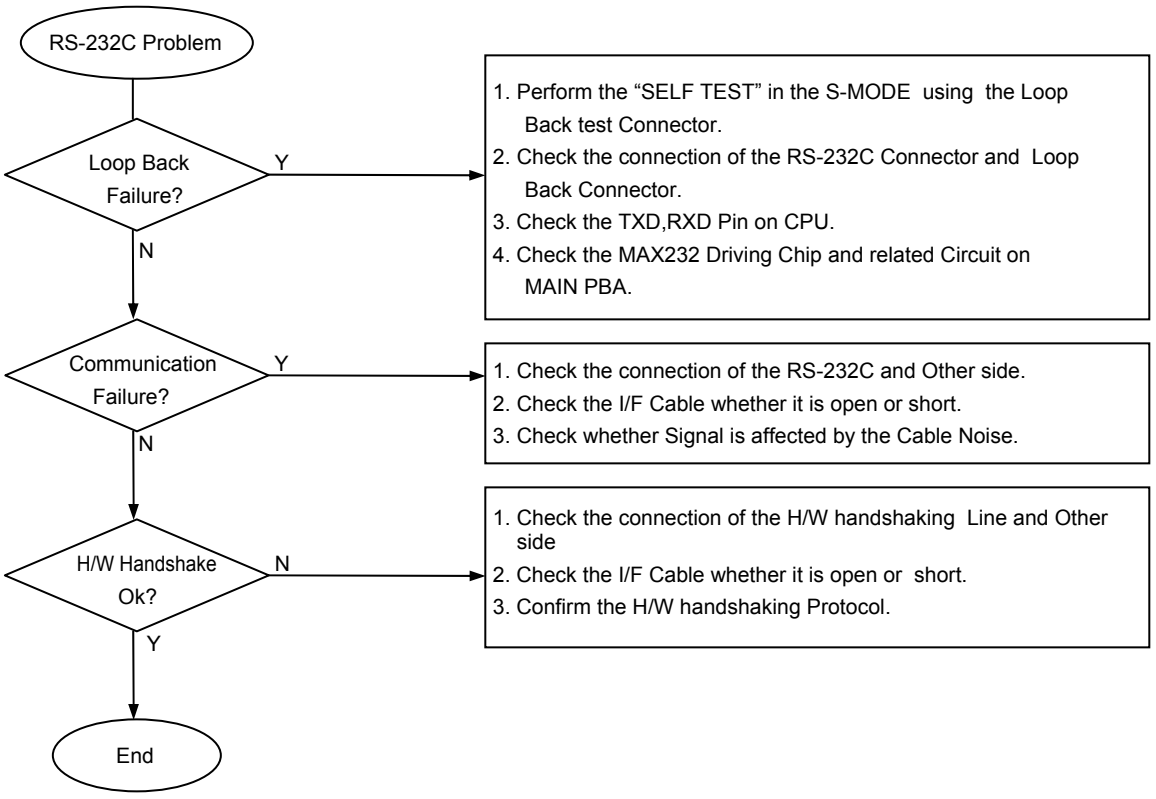
8-5 Key Board Problem


Key Board Problem
Key Input Failure ?
Y
1. Check the Key Scan Part 74HC138(U27)
2. Check the Key Return Part 74HCT541(U2)
3. Check the related Circuit and Pattern
4. Check & Change Key Board Assy
5. Check the KBD Connector on PBA
N
Specific Key Failure?
Y
1. Check the affected Key
2. Check the Matrix Bus & Data Bus
3. Check the Diodes(D22~D29)
4. Check the Key Board Assy
N
Mode Key Ok?
N
1. Check the Harness & Mode Key Assy
2. Check Diode (D18)
3. Check the 74HCT541 & Data Bus & CPU P10.3
Y
End

8-6 Drawer and Spool Motor Problem


Drawer Problem
Drawer Open Failure ?
Y
1. Check the Drawer Connector & Harness.
2. Check the related circuit & Component KSD288 (Q1) MMBT2222A(Q2) on Main PBA.
3. Check the Solenoid in the Drawer.
N
Compulsory Failure?
Y
1. Check the Compulsory Harness & Connector.
2. Check the Micro switch in the Drawer.
N
End

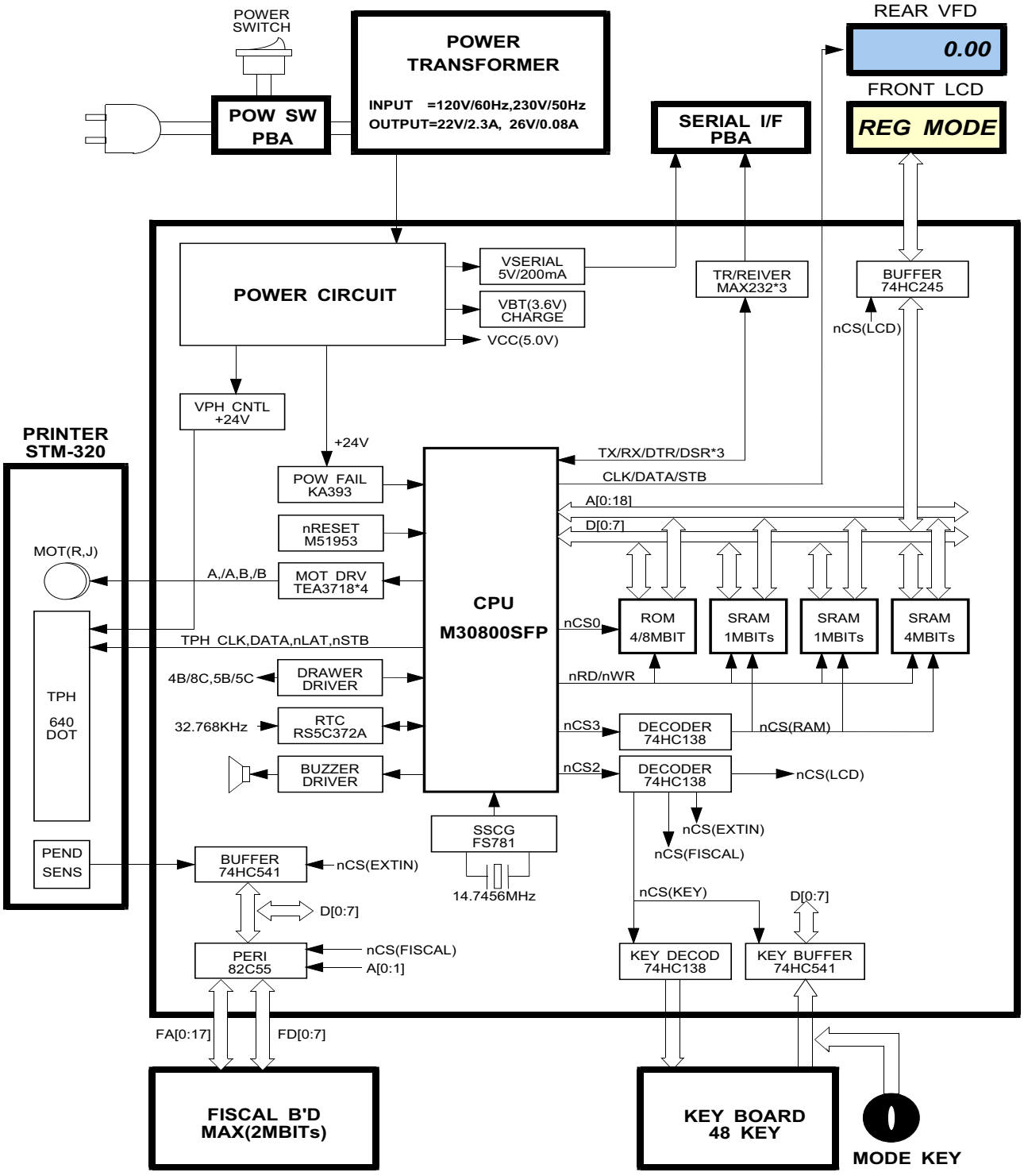
8-7 RS-232C Serial Communication Problem


RS-232C Problem
Loop Back Failure?
Y
1. Perform the “SELF TEST” in the S-MODE using the Loop Back test Connector.
2. Check the connection of the RS-232C Connector and Loop Back Connector.
3. Check the TXD,RXD Pin on CPU.
4. Check the MAX232 Driving Chip and related Circuit on MAIN PBA.
N
Communication Failure?
Y
1. Check the connection of the RS-232C and Other side.
2. Check the I/F Cable whether it is open or short.
3. Check whether Signal is affected by the Cable Noise.
N
H/W Handshake Ok?
N
1. Check the connection of the H/W handshaking Line and Other side
2. Check the I/F Cable whether it is open or short.
3. Confirm the H/W handshaking Protocol.
Y
End

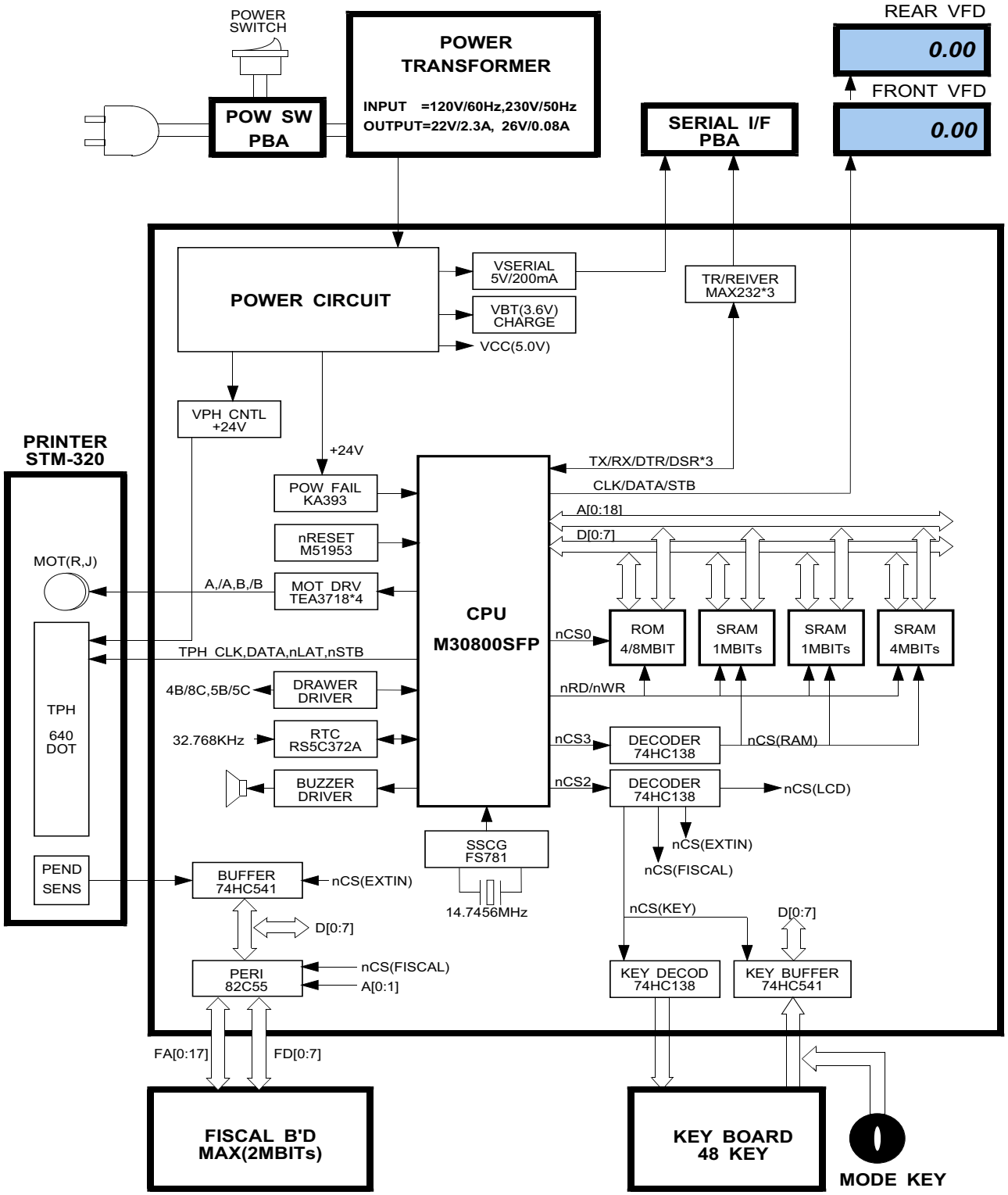
MEMO

9 Block Diagram

9-1 ER-430M



9-2 ER-430 / ER-430F



9-3 Power Block Diagram

This system is operated under 120Vac or 230Vac. All data is saved by the Battery when the Main power is turned off. The power circuit supplies the five different DC voltage sources and one AC voltage source.

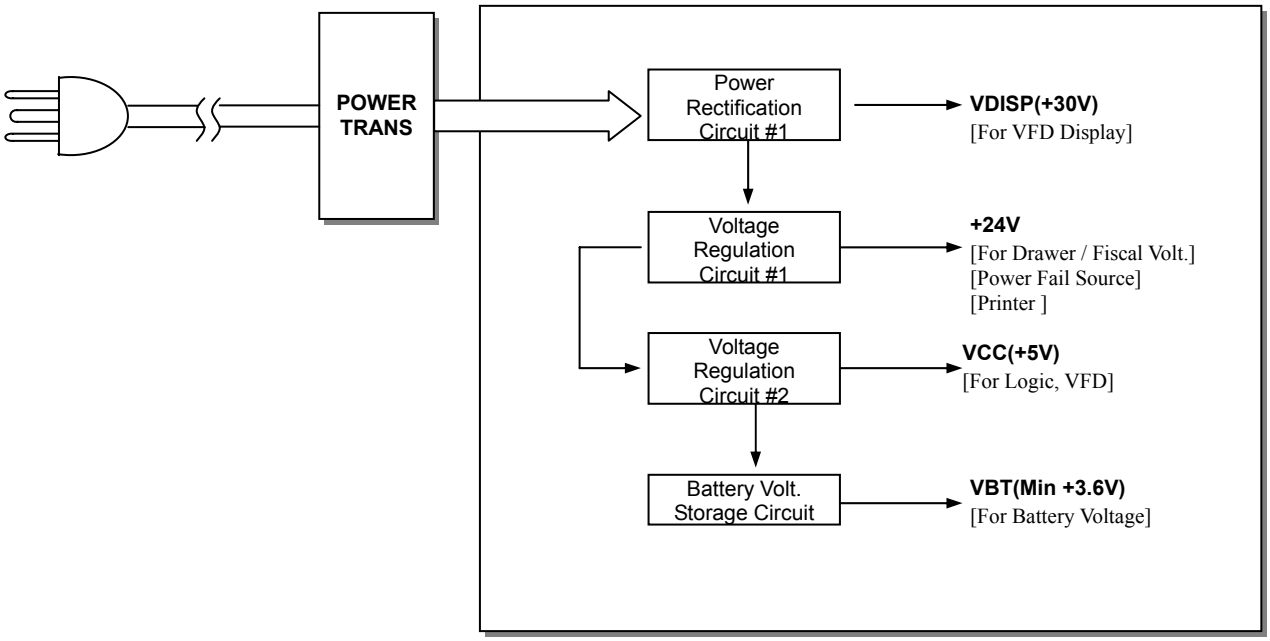


Figure 9-1 Power Block Diagram

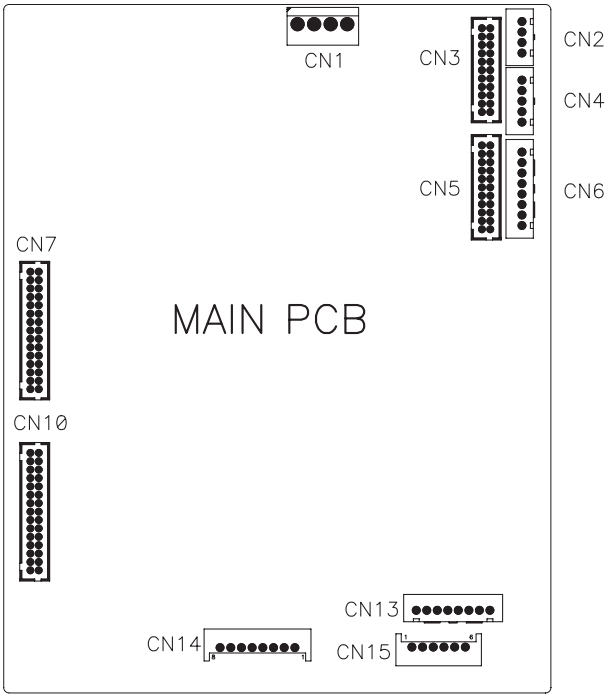
No.	Voltage	Description
1	VDISP (+30VDC)	VFD Grid/Anode Driving Voltage
2	+24 (+24VDC)	Cash Drawer Solenoid Driving / Fiscal Writing Voltage
3	VCC (+5VDC)	Logic IC Driving / VFD Filament Voltage
4	VBT (+Min 3.6VDC)	Battery Voltage (Use for RTC, SRAM)

Table 9-1 Power Source Voltage Descriptions

MEMO

10 Wiring Diagram

10-1 Wiring Pin Connection



CN7 = Main to Printer		CN6=Display (VFD)		CN10 = Main to Fiscal PBA I/F	
No	Signal Name	No	Signal Name	No.	Signal Name
1	VCC	1	SEN_DISPDISCON	1	FA17
2	GND	2	VCC	2	FA16
3	P/END Sensor OUT(RECEIPT)	3	DISPLAY_CLK	3	FA7
4	P/END Sensor In(RECEIPT)	4	DISPLAY_LATCH	4	FA3
5	P/END Sensor OUT(JOURNAL)	5	GND	5	FA6
6	P/END Sensor In(JOURNAL)	6	VDISP	6	FA2
7	GND	7	VCC	7	FA5
8	PAPER DISCONNECTION IN	8	DIPLAY_DATA	8	FA1
9	ADC THERMISTER IN			9	FA4
10	TPH CLOCK	CN2=Drawer		10	FA0
11	TPH STROBE #2	No	Signal Name	11	CS_FISCAL EPROM
12	TPH DATA	1	GND	12	FA15
13	GND	2	SEN_DWRCOMP	13	GND
14	JOURNAL LF MOTOR OUT #A	3	DRAWER	14	FA14
15	TPH STROBE #1	4	VDRV	15	VCC
16	JOURNAL LF MOTOR OUT #A-			16	FA13
17	TPH LATCH	CN4=Black Box		17	VPP
18	JOURNAL LF MOTOR OUT #B	No	Signal Name	18	FA12
19	VPH(+24V)	1	VCC	19	FD3
20	JOURNAL LF MOTOR OUT #B-	2	TXD1/CLK	20	FA8
21	VPH(+24V)	3	RXD1/DATA	21	FD4
22	VPH(+24V)	4	GND	22	FA9
23	VPH(+24V)			23	FD5
24	RECEIPT LF MOTOR OUT #A	**CN14 / 15= Keyboard**		24	FA10
25	GND			25	FD6
26	RECEIPT LF MOTOR OUT #A-	**CN3= RS-232 / CN5=LCD DISPLAY**		26	FA11
27	GND			27	FD7
28	RECEIPT LF MOTOR OUT #B	**CN13 = MODE KEY**		28	FD0
29	GND			29	FD2
30	RECEIPT LF MOTOR OUT #B-			30	FD1

11 Schematic Diagrams

[Schematics Sheet Content]

1. Main PCB Schematics.

1) CPU Block (ER-430M) ---------- 11-2
2) CPU Block (ER-430F) ---------- 11-3
3) Memory, RTC, Decoder Block---------- 11-4
4) Power Fail, Buzzer, Display Block ---------- 11-5
5) External In/Out, Serial I/F Block ---------- 11-6
6) Key Scan Block ---------- 11-7
7) Printer Block ---------- 11-8
8) Fiscal I/F Block ---------- 11-9
9) Power Block ---------- 11-10

2. Power Switch PCB Schematics. ---------- 11-11

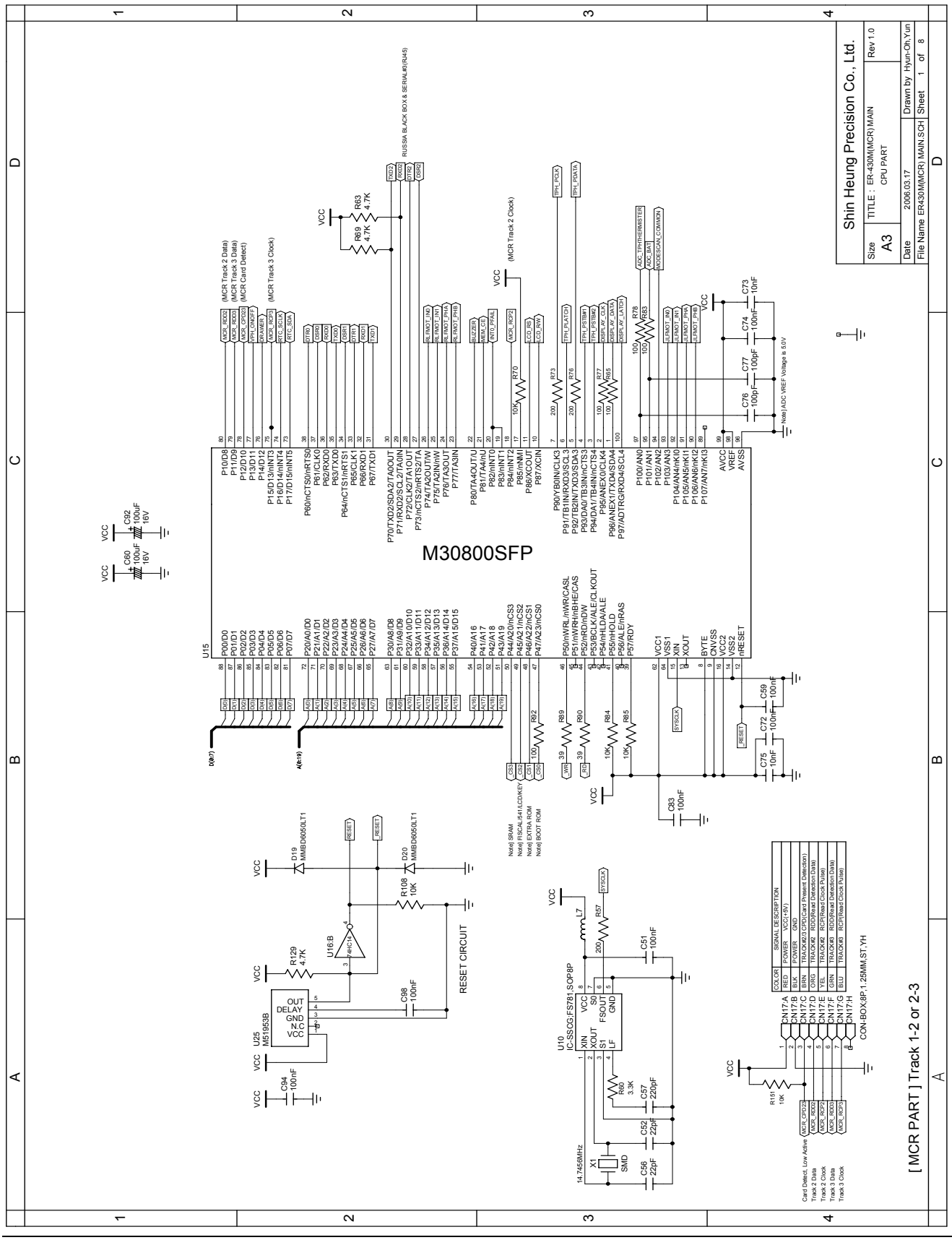
3. Display PCB Schematics.

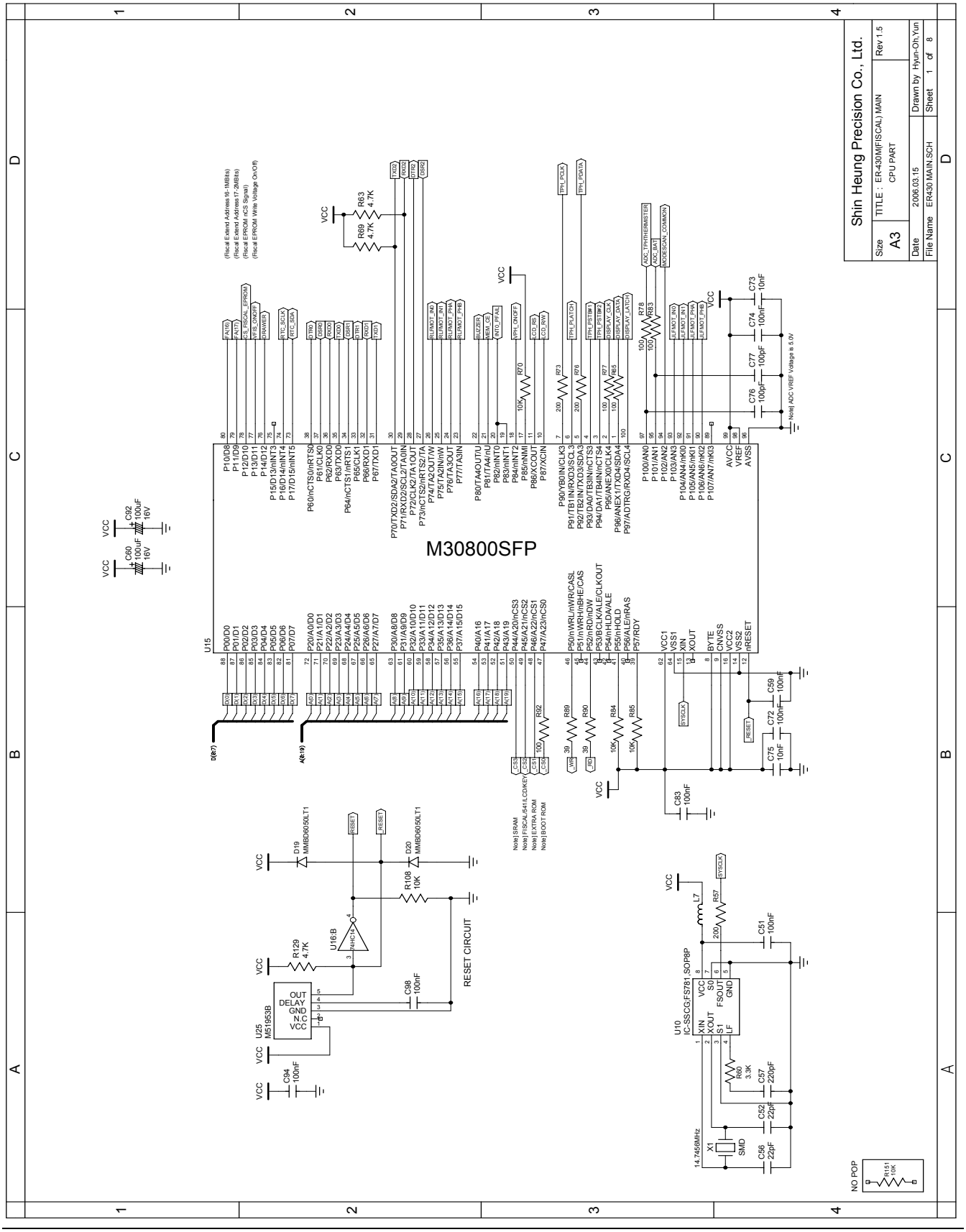
1) VFD Front Schematics(ER-430F) ---------- 11-12
2) VFD Rear Schematics(ER-430F) ---------- 11-13
3) VFD Rear Schematics(ER-430M)---------- 11-14

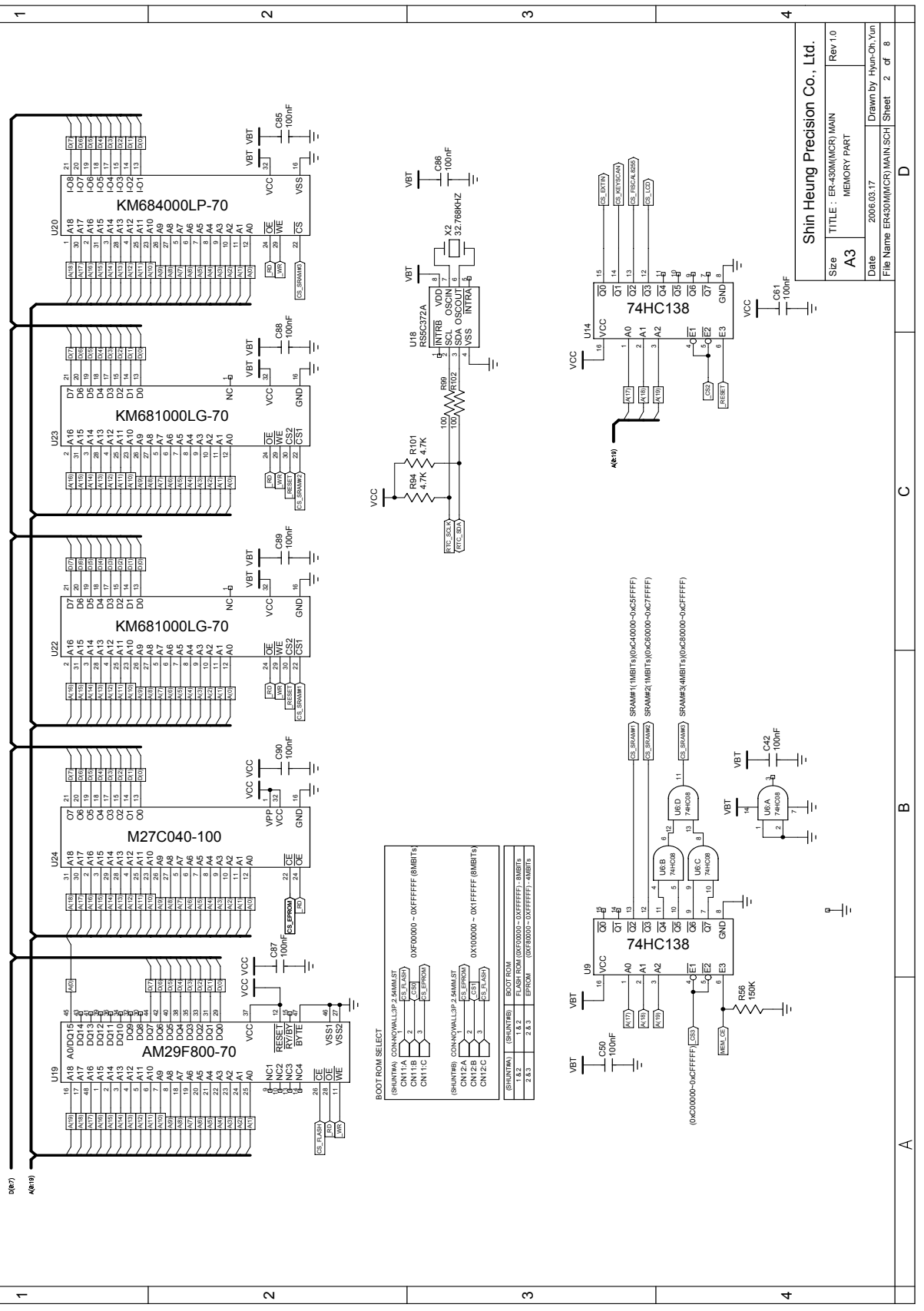
4. Fiscal PCB Schematics. ---------- 11-15

5. STM-320 Printer PCB Schematics. ---------- 11-16

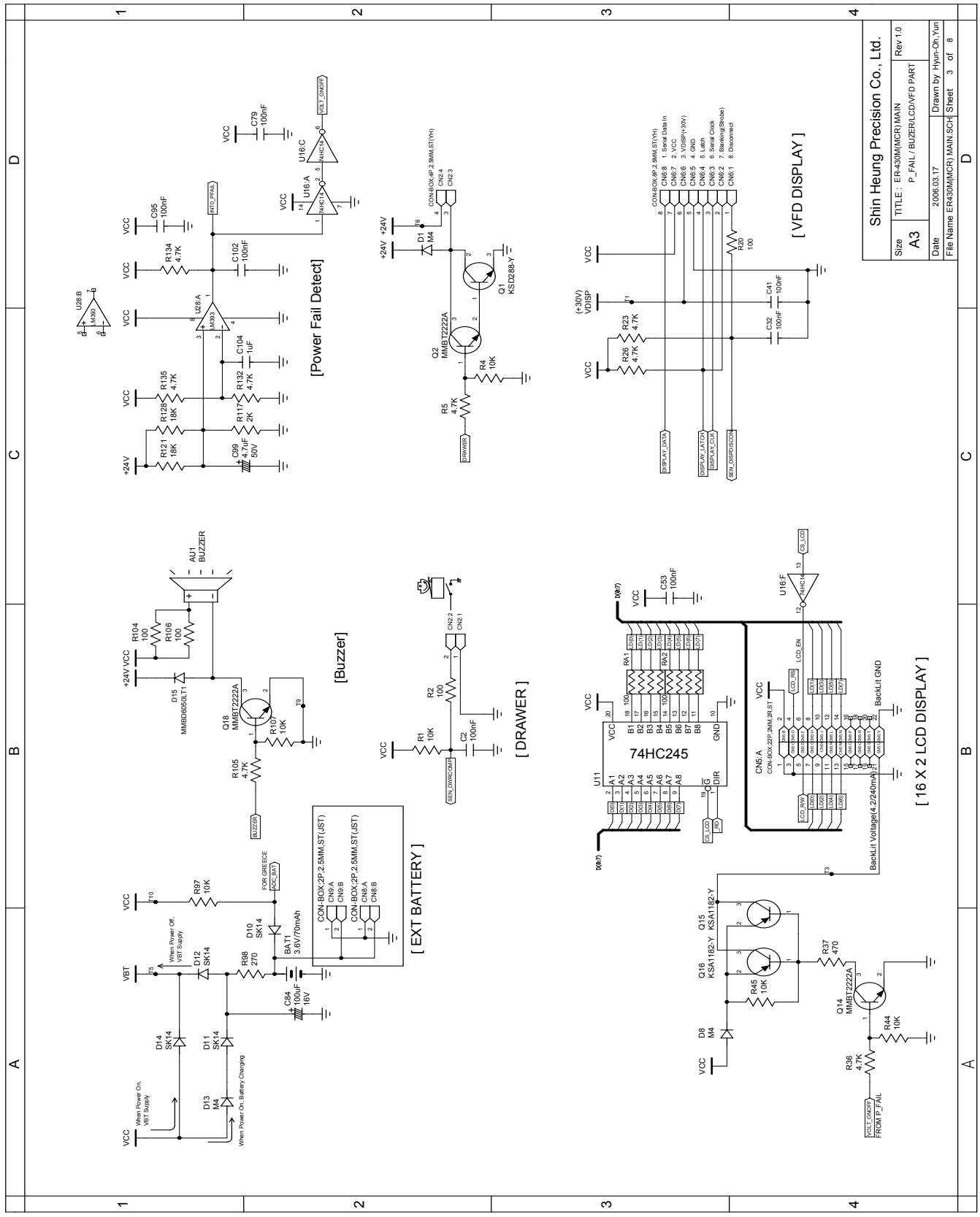
6. Serial Interface PCB Schematics.---------- 11-17

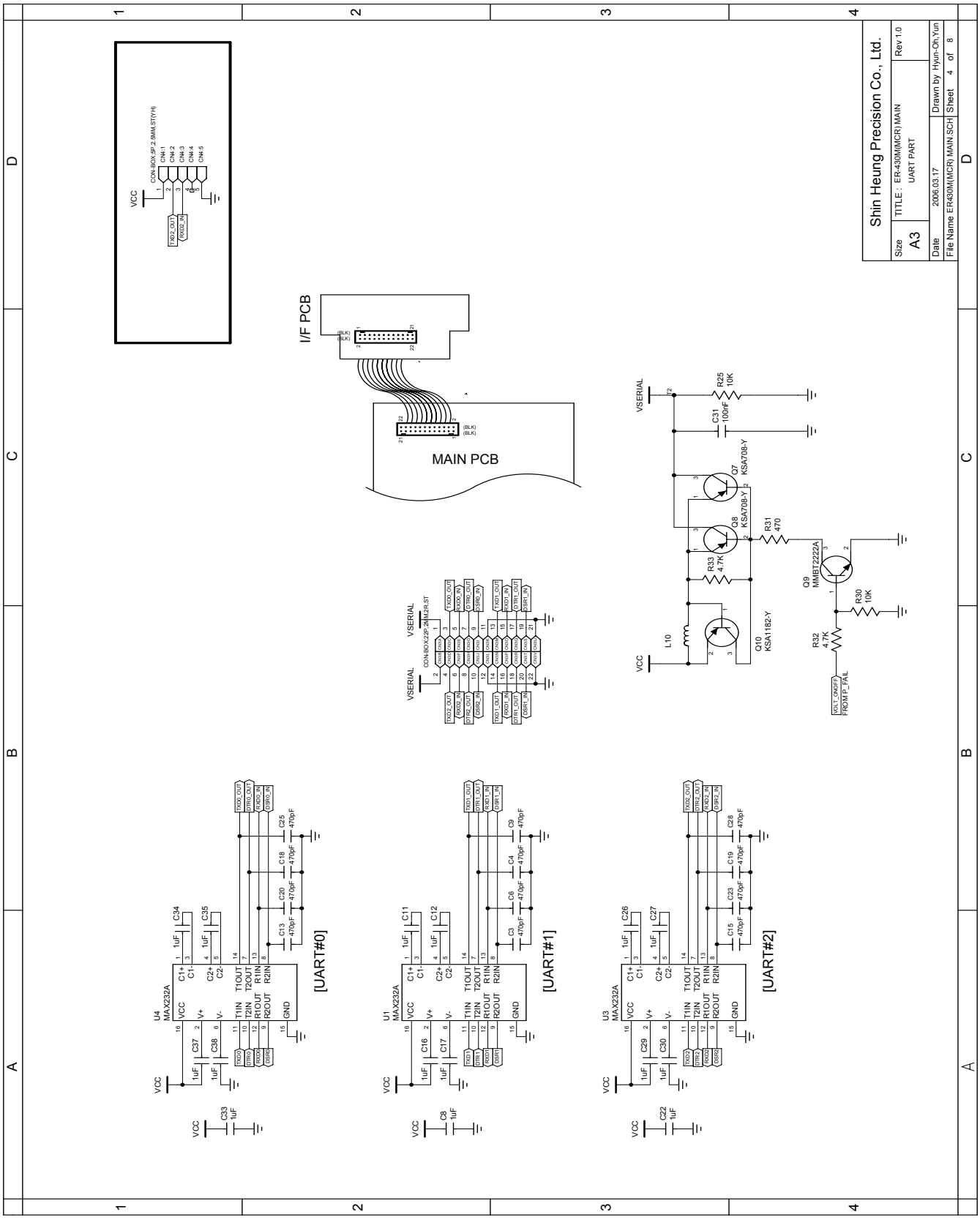

Shin Heung Precision Co., Ltd.
TITLE : ER-430M(MCR) MAIN CPU PART
Rev 1.0
Size A3
Date 2006.03.17
Drawn by Hyun-Oh,Yun
File Name ER430M(MCR) MAIN.SCH
Sheet 1 of 8
M30800SFP
U15
[MCR PART] Track 1-2 or 2-3
RESET CIRCUIT
U25 M51953B
U16:B
U10 IC-SSCG-FS781.SOP8P
14.7456MHz
X1
SMD
D19 MMBD6005LT1
D20 MMBD6005LT1
U25 M51953B
CON-BOX;8P-1.25MM,ST,YH
(MCR Track 2 Data)
(MCR Track 3 Data)
(MCR Card Detect)
(MCR Track 3 Clock)
(MCR Track 2 Clock)
RUSSIA BLACK BOX & SERIAL#2(RJ45)
Note) SRAM
Note) FSCAL-641(LCD/KEY
Note) EXTRA ROM
Note) BOOT ROM
Note) ADC: VREF Voltage is 5.0V
CN17:A
CN17:B
CN17:C
CN17:D
CN17:E
CN17:F
CN17:G
CN17:H
SIGNAL DESCRIPTION
POWER +5V(+4V)
POWER GND
TRACK#2/3 CPD(Card Present Detection)
TRACK#2 RDD(Read Detection Data)
TRACK#2 RCP(Read Clock Pulse)
TRACK#3 RDD(Read Detection Data)
TRACK#3 RCP(Read Clock Pulse)
Card Detect, Low Active
Track 2 Data
Track 2 Clock
Track 3 Data
Track 3 Clock


Shin Heung Precision Co., Ltd.
TITLE : ER-430M(FISCAL) MAIN CPU PART
Rev 1.5
Size A3
Date 2006.03.15
Drawn by Hyun-Oh,Yun
File Name ER430 MAIN.SCH
Sheet 1 of 8
M30800SFP
U15
RESET CIRCUIT
U10 IC-SSCG;FS781,SOP8P
U25 M51953B
X1 14.7456MHz SMD
NO POP
Note) ADC VREF Voltage is 5.0V
Note) SRAM
Note) FISCAL/541/LCD/KEY
Note) EXTRA ROM
Note) BOOT ROM

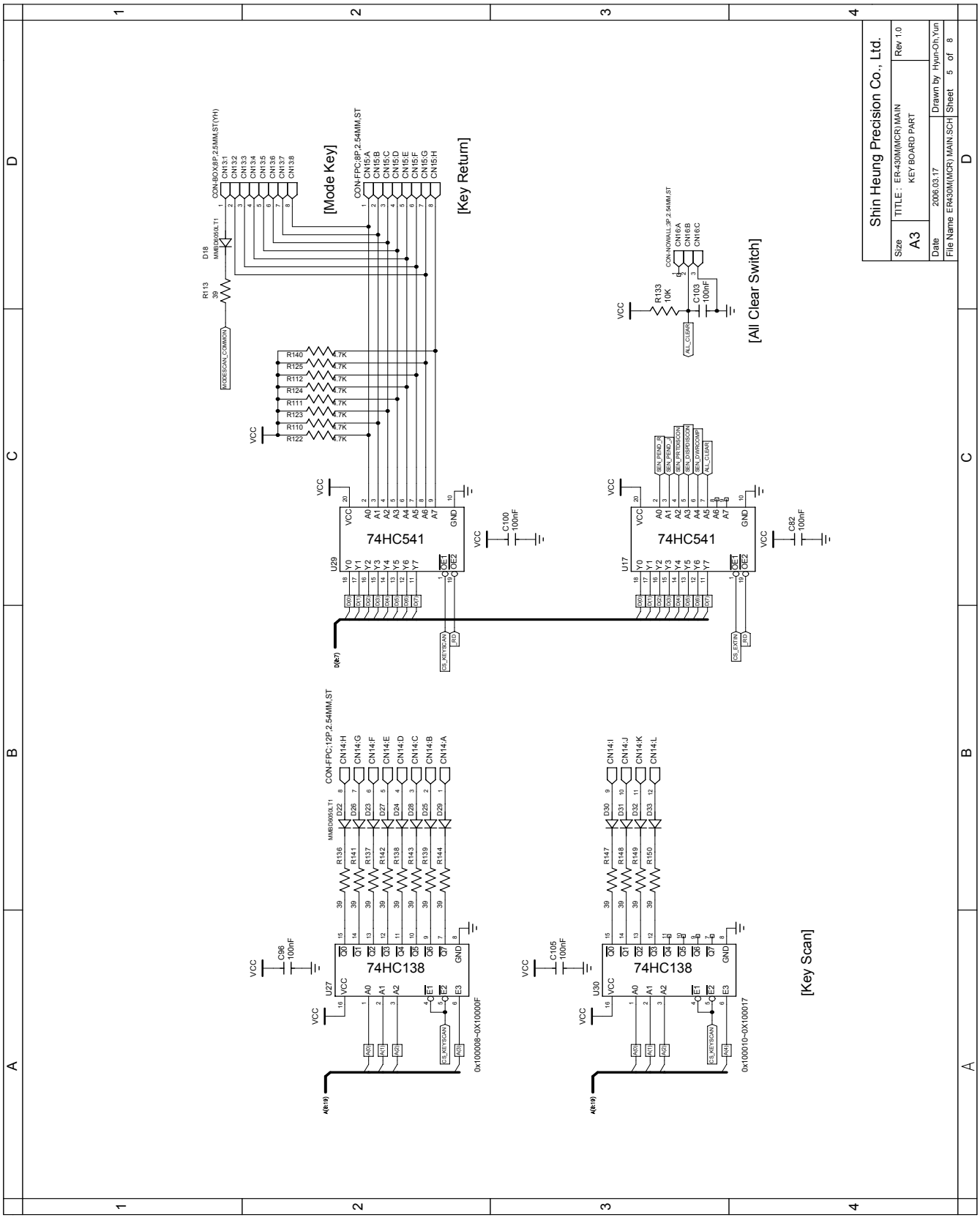

KM684000LP-70
KM681000LG-70
KM681000LG-70
M27C040-100
AM29F800-70
74HC138
74HC138
RS5C372A
32.768KHZ
BOOT ROM SELECT
(SHUNT#A) CON-NOVALL3P-2.54MM.ST
CN11:A
CN11:B
CN11:C
0XF00000 ~ 0XFFFFFF (8MBITs)
(SHUNT#B) CON-NOVALL3P-2.54MM.ST
CN12:A
CN12:B
CN12:C
0X100000 ~ 0X1FFFFF (8MBITs)
(SHUNT#A) (SHUNT#B) BOOT ROM
1 & 2 1 & 2 FLASH ROM (0XF00000~0XFFFFFF) - 8MBITs
2 & 3 2 & 3 EPROM (0XF80000~0XFFFFFF) - 4MBITs
SRAM#1(1MBITs)(0xC40000~0xC5FFFF)
SRAM#2(1MBITs)(0xC60000~0xC7FFFF)
SRAM#3(4MBITs)(0xC80000~0xCFFFFF)
(0xC00000~0xCFFFFF)
Shin Heung Precision Co., Ltd.
TITLE : ER-430M(MCR) MAIN
MEMORY PART
Size A3
Rev 1.0
Date 2006.03.17
Drawn by Hyun-Oh,Yun
File Name ER4301M(MCR).MAIN.SCH
Sheet 2 of 8

11-3 DISPLAY, BUZZER, FAIL PART

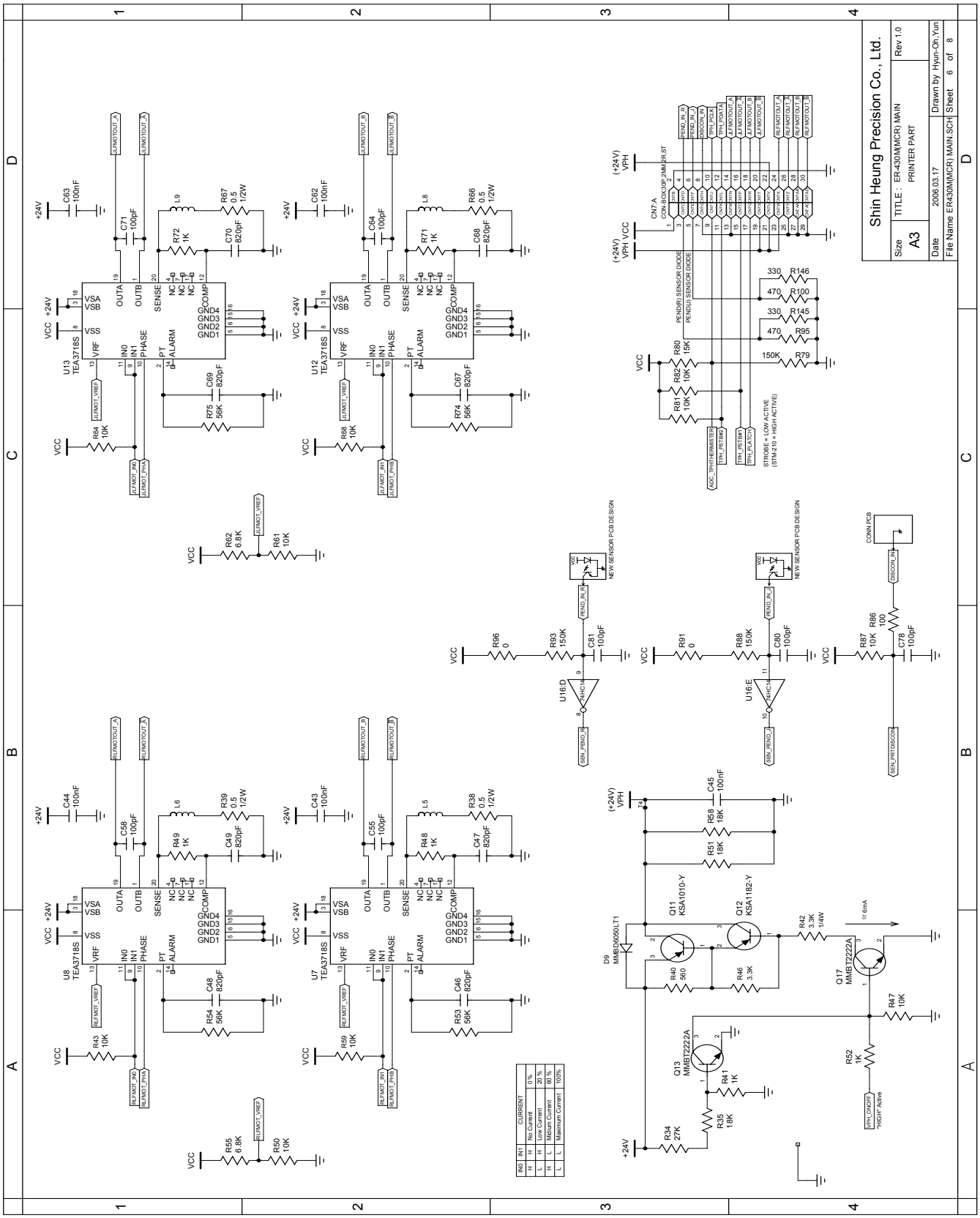


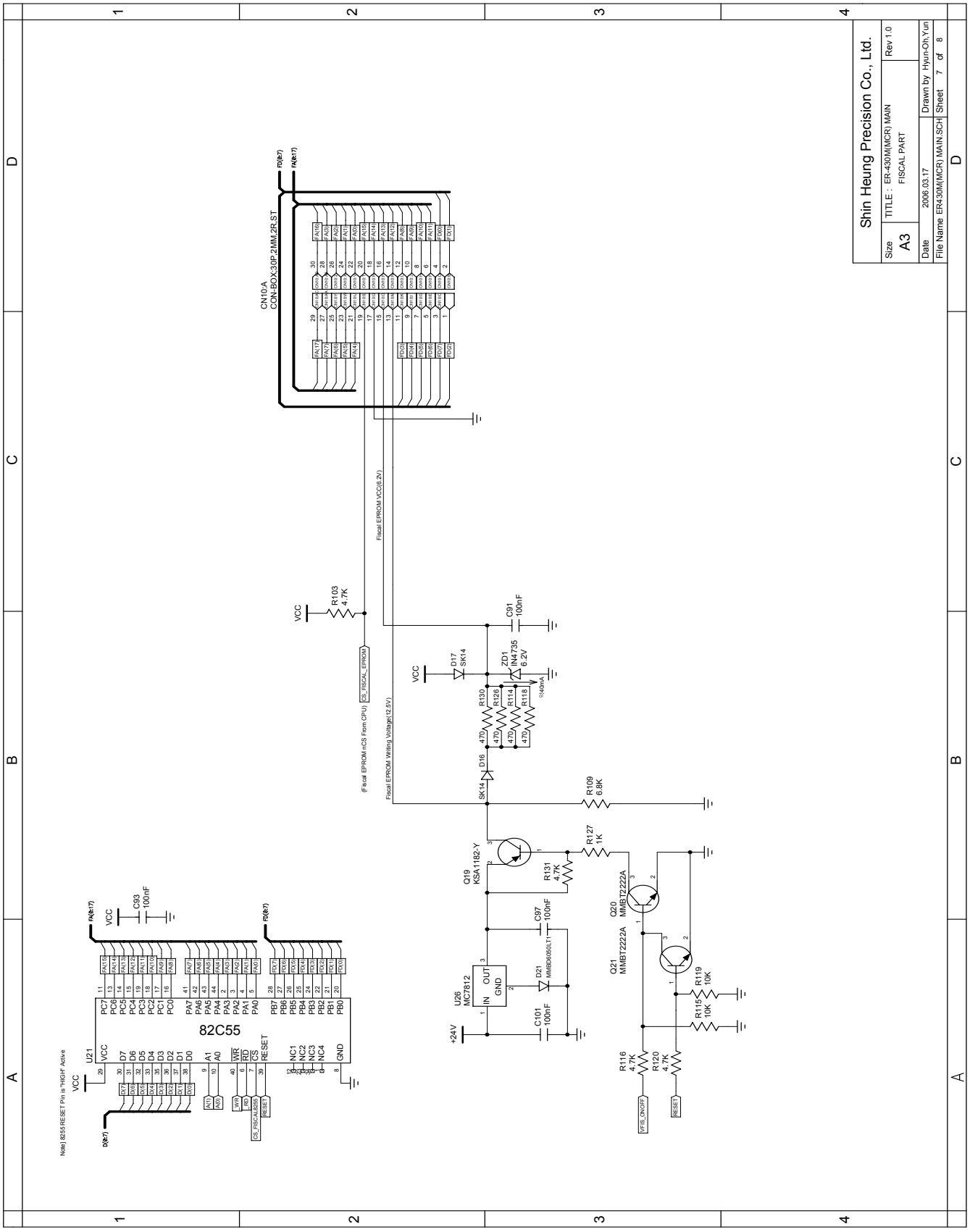

Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-430M(MCR) MAIN
UART PART
Rev 1.0
Date 2006.03.17
Drawn by Hyun-Oh,Yun
File Name ER430M(MCR) MAIN SCH
Sheet 4 of 8
I/F PCB
MAIN PCB
[UART#0]
[UART#1]
[UART#2]
MAX232A
VCC
VSERIAL
L10
Q10 KSA1182-Y
Q8 KSA708-Y
Q7 KSA708-Y
Q9 MMBT2222A
R25 10K
R31 470
R33 4.7K
R32 4.7K
R30 10K
C31 100nF

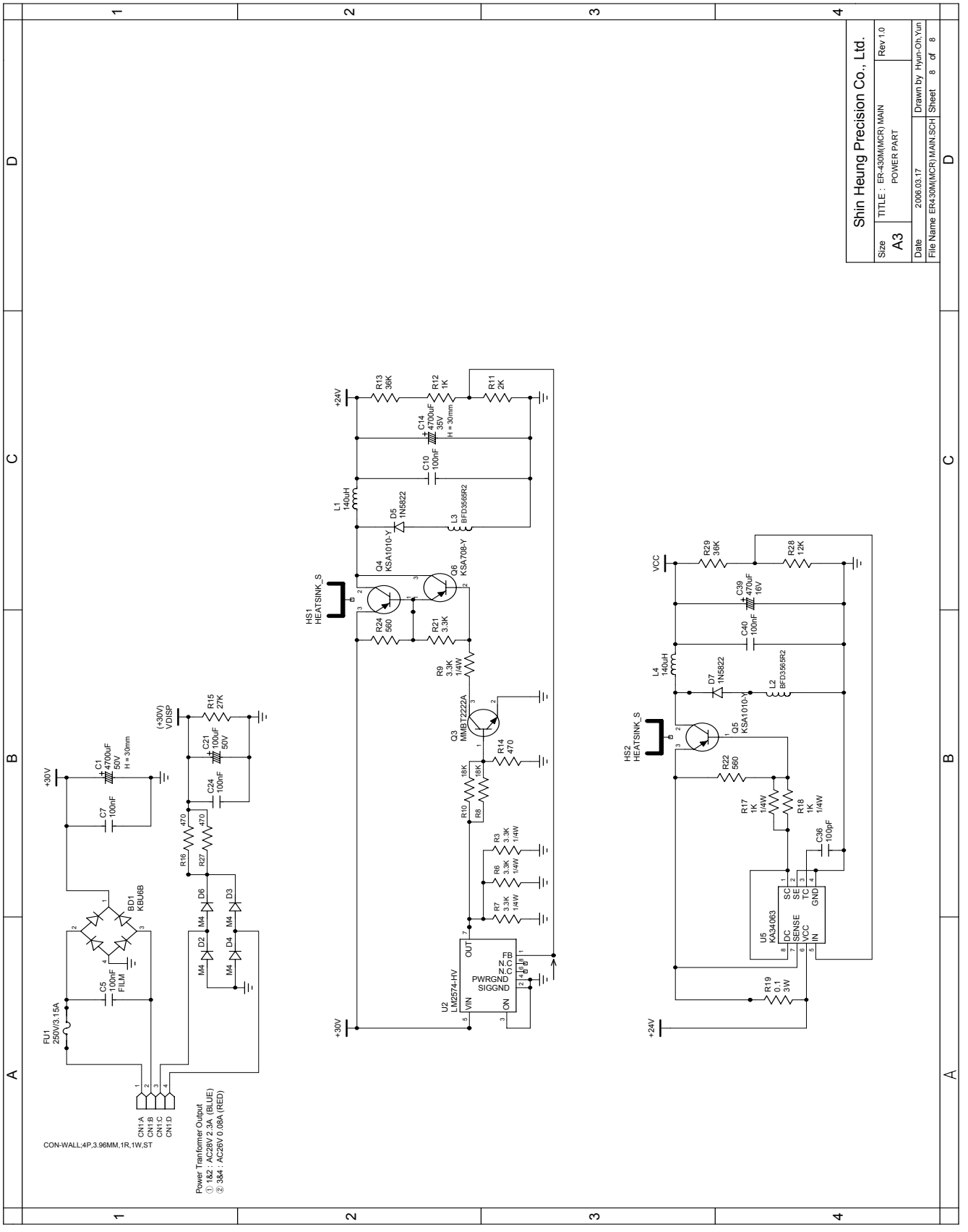
11-5 KEY SCAN PART

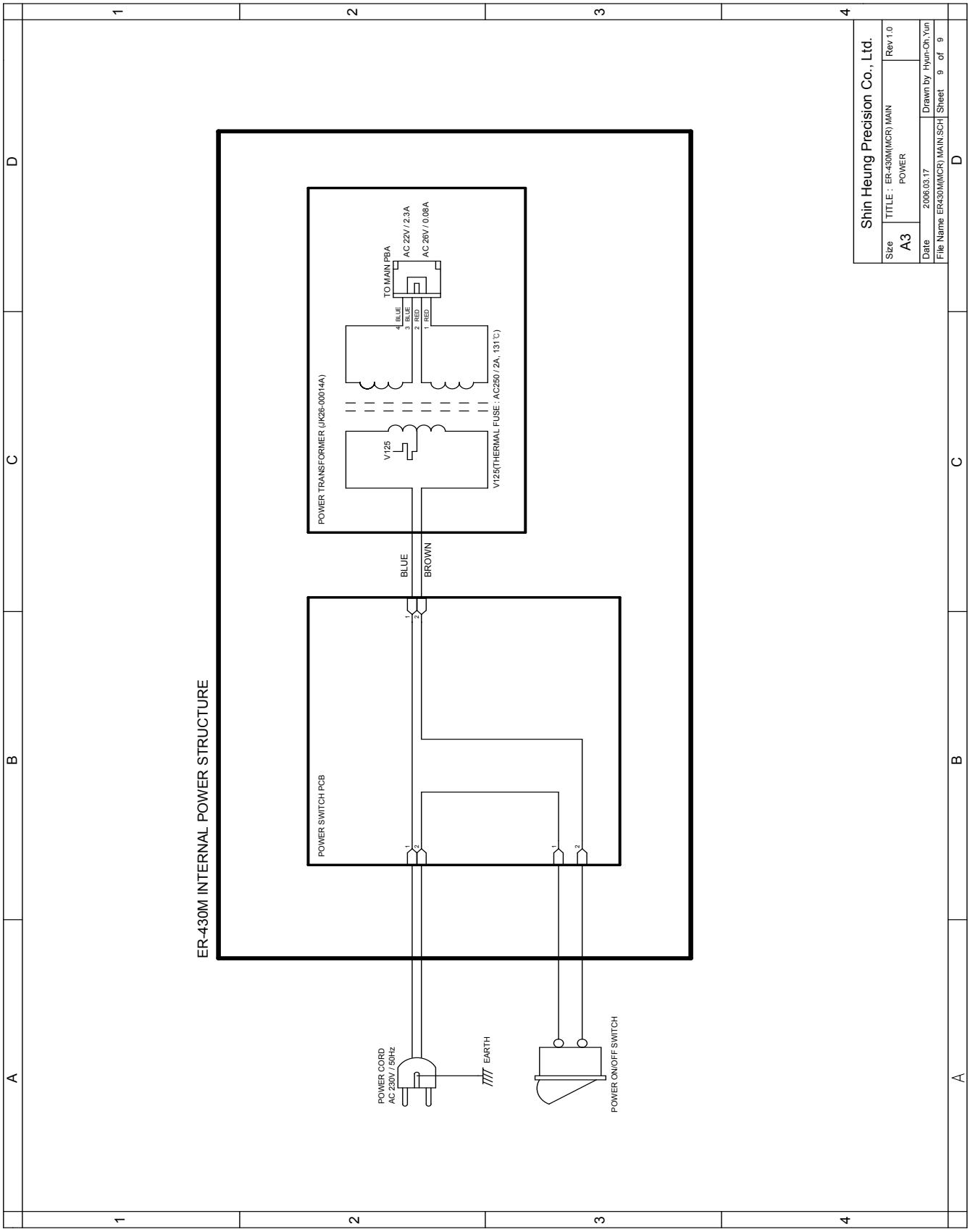


11-6 PRINTER PART

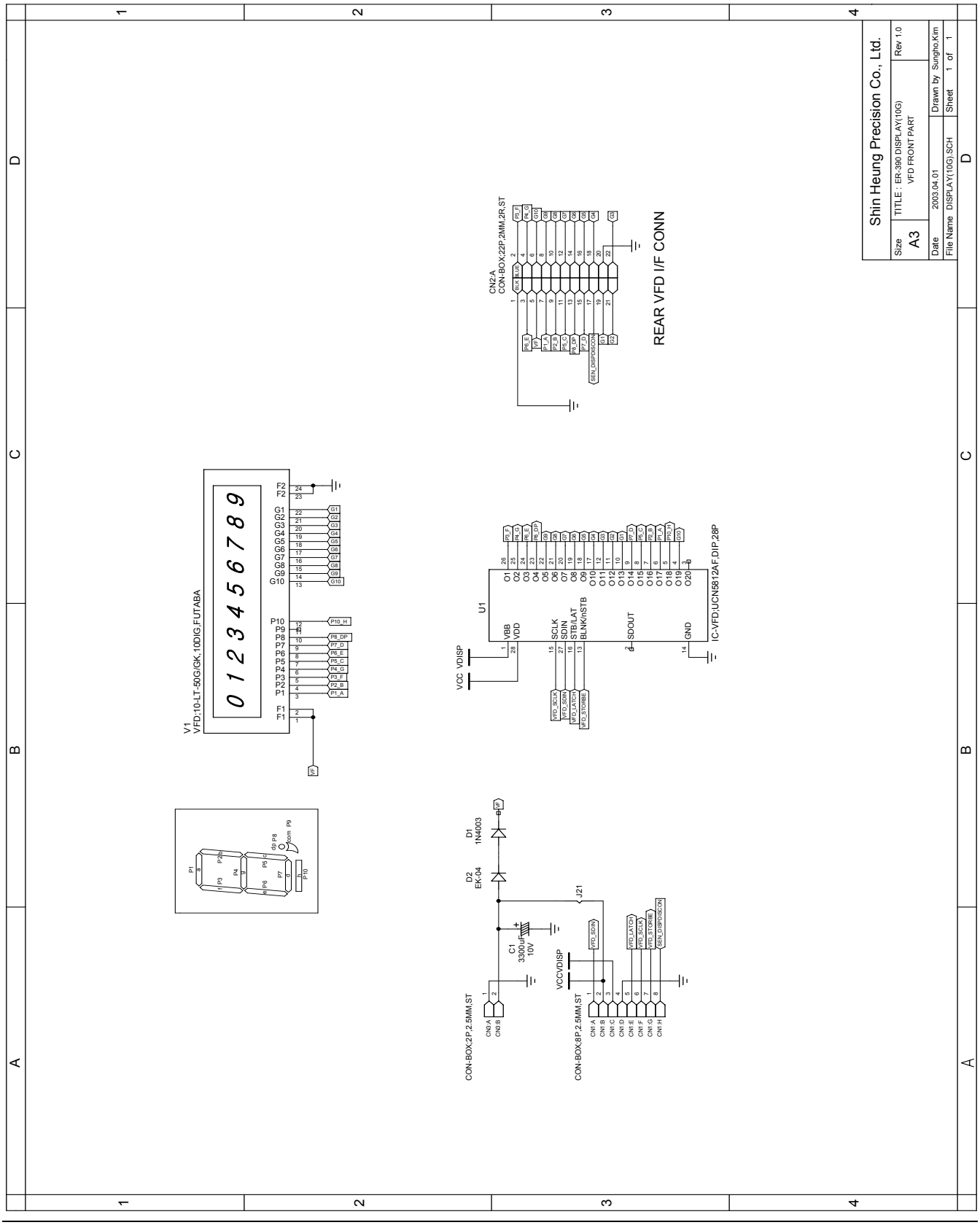



Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-430M(MCR) MAIN
FISCAL PART
Rev 1.0
Date 2006.03.17
Drawn by Hyun-Oh,Yun
File Name ER430M(MCR) MAIN.SCH
Sheet 7 of 8
CN10:A
CON-BOX;30P.2MM,2R.ST
U21
82C55
U26
MC7812
Q19
KSA1182-Y
Q20
MMBT2222A
Q21
MMBT2222A
D17
SK14
ZD1
IN4735
6.2V
D16
SK14
R103
4.7K
R109
6.8K
R127
1K
R131
4.7K
R130
470
R126
470
R114
470
R118
470
R115
10K
R119
10K
R116
4.7K
R120
4.7K
C91
100nF
C93
100nF
C97
100nF
C101
100nF
D21
MMBD6050LT1
+24V
VCC
Fiscal EPROM VCC(6.2V)
Fiscal EPROM Writing Voltage(12.5V)
(Fiscal EPROM nCS From CPU)
CS_FISCAL_EPROM
CS_FISCALBOX
RESET
WR
RD
A0
A1
D(0:7)
FA(0:17)
Note) 82C55 RESET Pin is "HIGH" Active

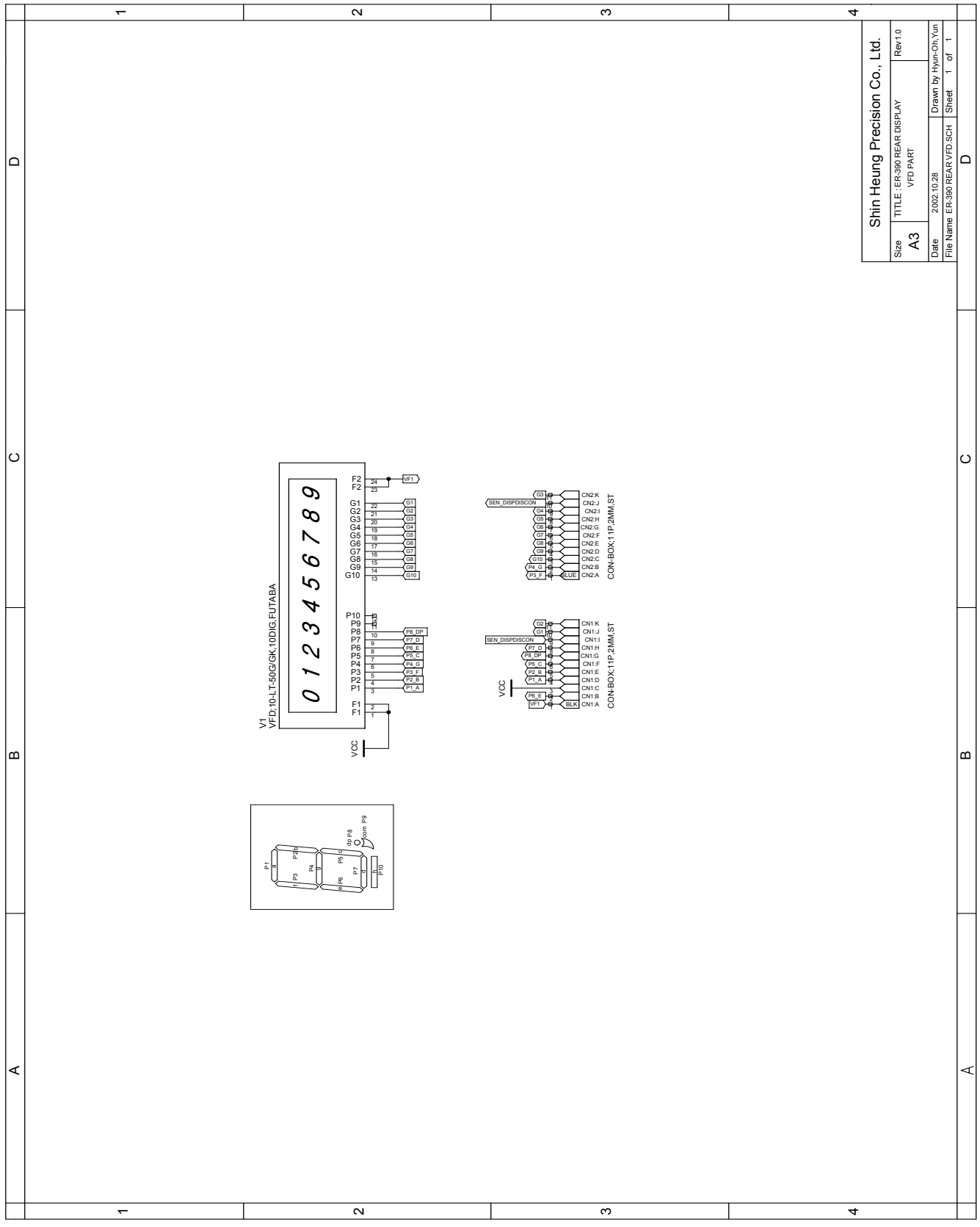

Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-430M(MCR) MAIN POWER PART
Rev 1.0
Date 2006.03.17
Drawn by Hyun-Oh,Yun
File Name ER430M(MCR) MAIN.SCH
Sheet 8 of 8
FU1 250V/3.15A
BD1 KBU6B
C1 470uF 50V H = 30mm
C7 100nF
C5 100nF FILM
C21 100uF 50V
C24 100nF
R15 27K
(+30V) VDISP
R16 470
R27 470
D6 M4
D3 M4
D2 M4
D4 M4
CN1:A
CN1:B
CN1:C
CN1:D
CON-WALL;4P,3.96MM,1R,1W,ST
Power Tranformer Output
① 1&2 : AC28V 2.3A (BLUE)
② 3&4 : AC26V 0.08A (RED)
U2 LM2574-HV
VIN
OUT
ON
FB
N.C
N.C
PWRGND
SIGGND
L1 140uH
D5 1N5822
L3 BFD3565R2
C14 4700uF 35V H = 50mm
C10 100nF
R13 36K
R12 1K
R11 2K
HS1 HEATSINK_S
Q4 KSA1010-Y
Q6 KSA708-Y
R24 560
R21 3.3K
R9 3.3K 1/4W
Q3 MMBT2222A
R14 470
R10 18K
R8 18K
R3 3.3K 1/4W
R6 3.3K 1/4W
R7 3.3K 1/4W
L4 140uH
D7 1N5822
L2 BFD3565R2
C39 470uF 16V
C40 100nF
R29 36K
R28 12K
HS2 HEATSINK_S
Q5 KSA1010-Y
R22 560
R17 1K 1/4W
R18 1K 1/4W
C36 100pF
U5 KA34063
SC
SE
TC
GND
DC
SENSE
VCC
IN
R19 0.1 3W
+30V
+24V
VCC


Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-430M(MCR) MAIN POWER
Rev 1.0
Date 2006.03.17
Drawn by Hyun-Oh,Yun
File Name ER430M(MCR) MAIN.SCH
Sheet 9 of 9
ER-430M INTERNAL POWER STRUCTURE
POWER TRANSFORMER (JK26-00014A)
TO MAIN PBA
AC 22V / 2.3A
AC 26V / 0.08A
4 BLUE
3 BLUE
2 RED
1 RED
V125
V125(THERMAL FUSE : AC250 / 2A, 131℃)
BLUE
BROWN
POWER SWITCH PCB
POWER CORD
AC 230V / 50Hz
EARTH
POWER ON/OFF SWITCH

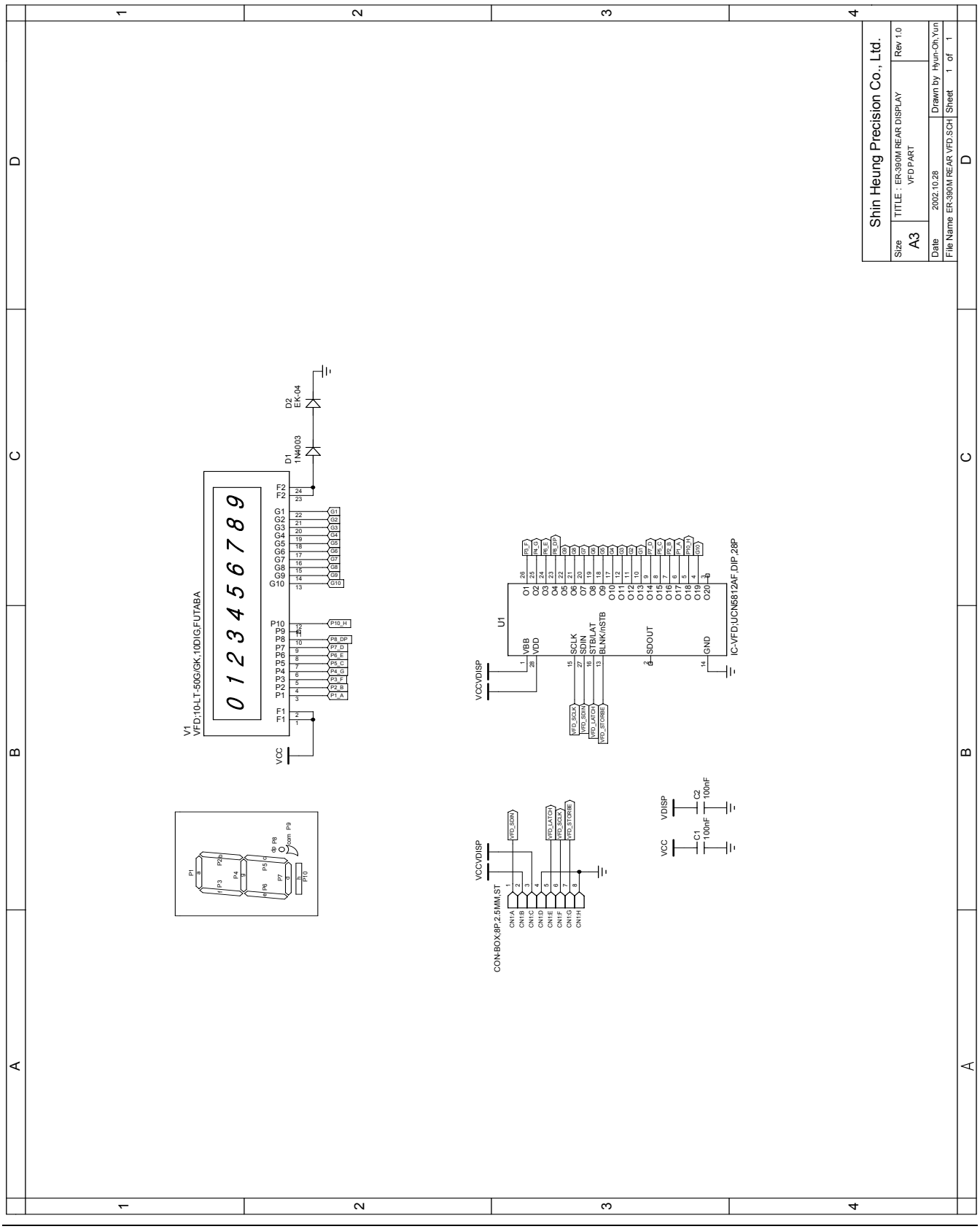
11-10 FRONT DISPLAY PCB (ER-430F)

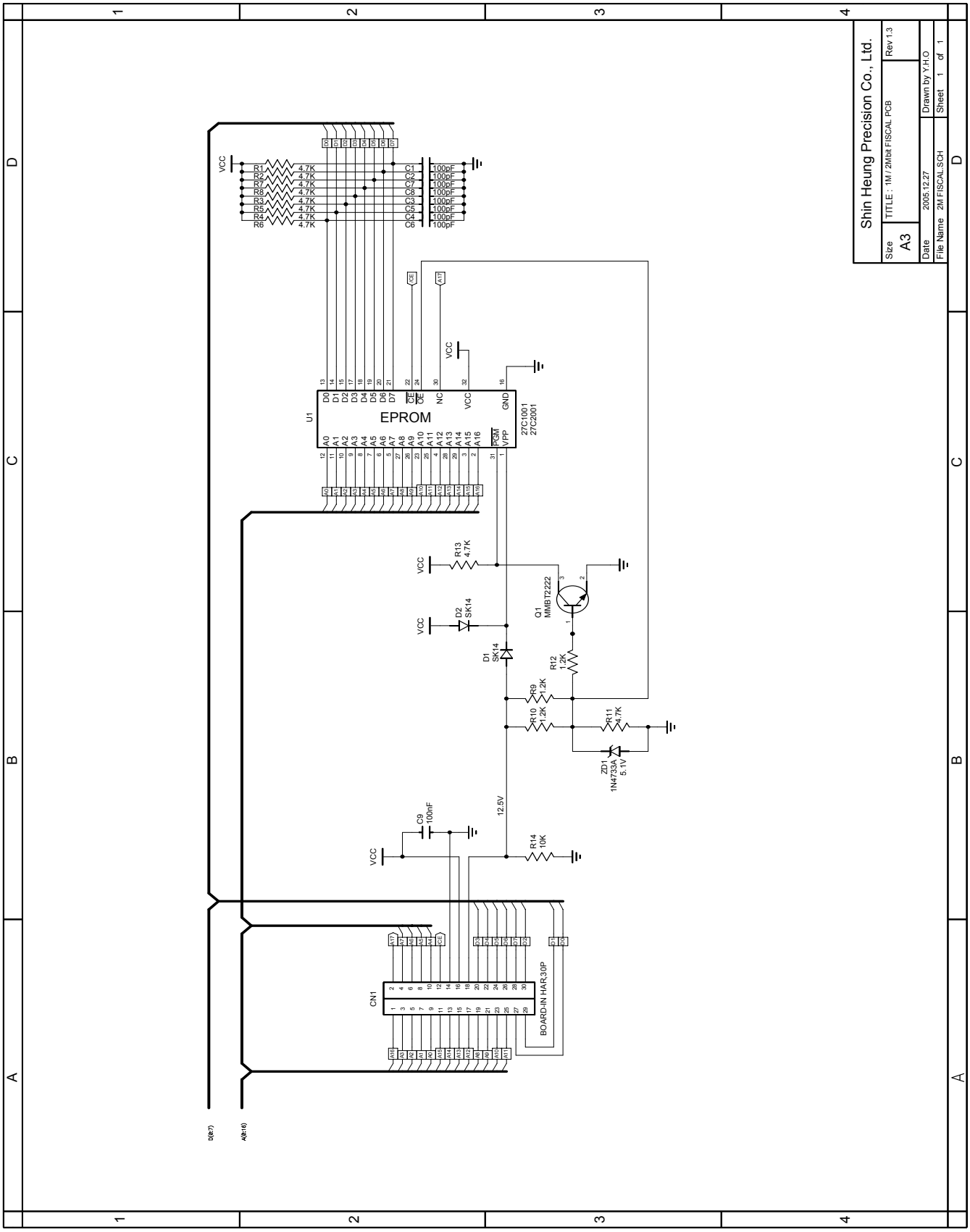


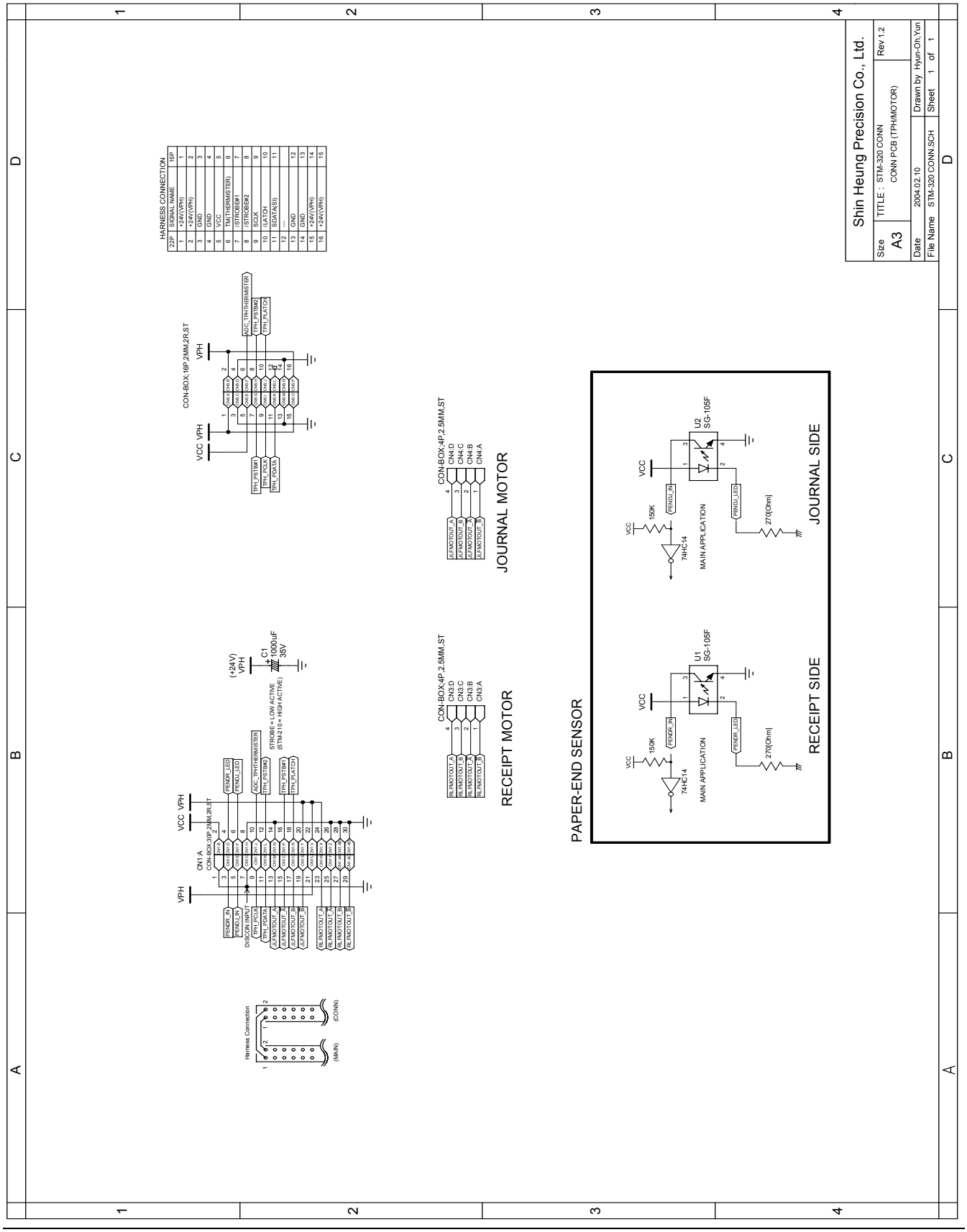
11-11 REAR DISPLAY PCB (ER-430F)

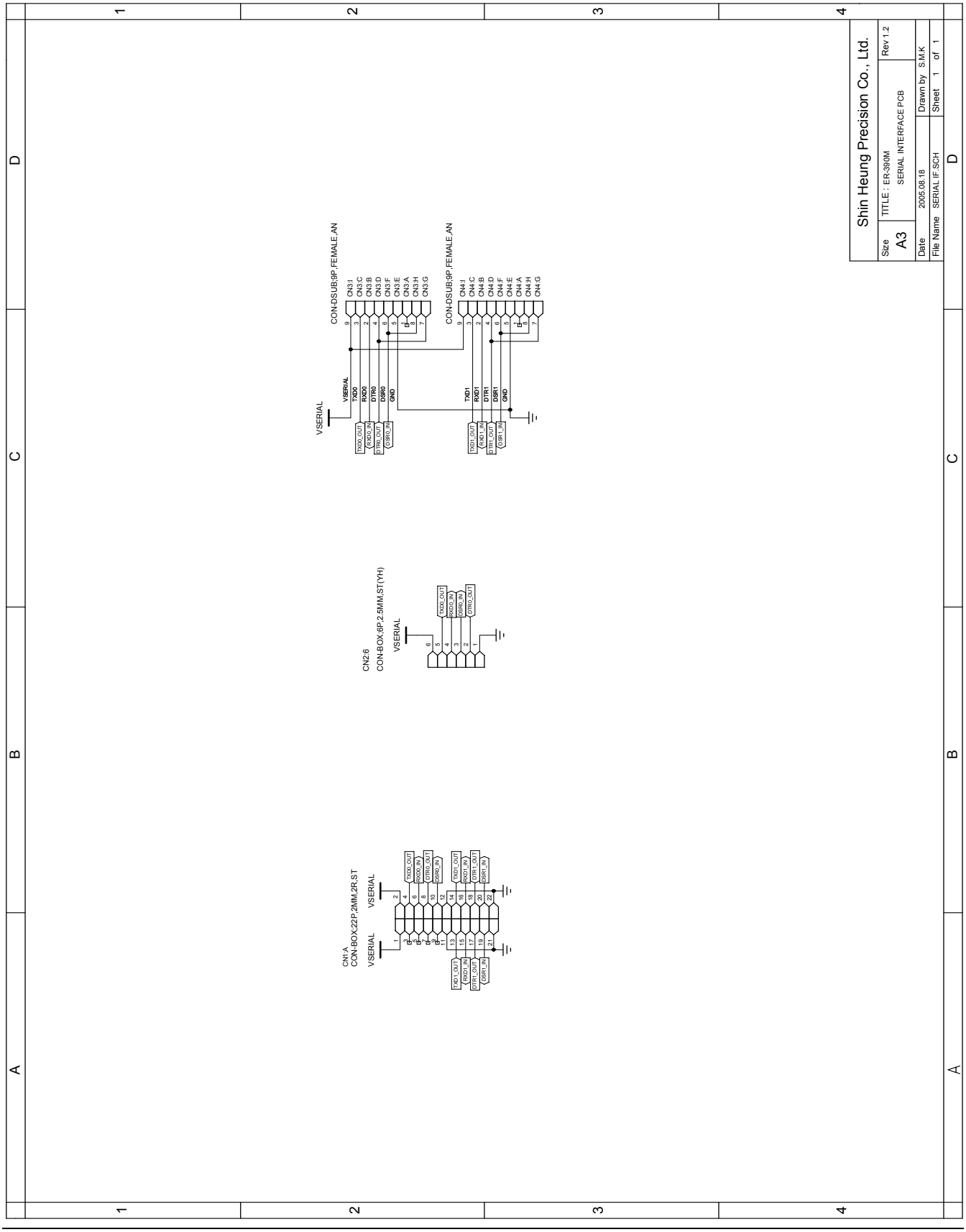


11-12 REAR DISPLAY PCB (ER-430M)




Shin Heung Precision Co., Ltd.
Size A3
TITLE : 1M / 2Mbit FISCAL PCB
Rev 1.3
Date 2005.12.27
Drawn by Y.H.O
File Name 2M FISCAL.SCH
Sheet 1 of 1
EPROM
27C1001
27C2001
BOARD-IN HAR.30P
VCC
12.5V
R1 4.7K
R2 4.7K
R7 4.7K
R8 4.7K
R3 4.7K
R5 4.7K
R4 4.7K
R6 4.7K
C1 100pF
C2 100pF
C7 100pF
C8 100pF
C3 100pF
C5 100pF
C4 100pF
C6 100pF
R13 4.7K
R12 1.2K
R9 1.2K
R10 1.2K
R11 4.7K
R14 10K
C9 100nF
D1 SK14
D2 SK14
Q1 MMBT2222
ZD1 1N4733A 5.1V
CN1


HARNESS CONNECTION
22P SIGNAL NAME 16P
1 +24V(VPH) 1
2 +24V(VPH) 2
3 GND 3
4 GND 4
5 VCC 5
6 TM(THERMISTER) 6
7 /STROBE#1 7
8 /STROBE#2 8
9 SCLK 9
10 /LATCH 10
11 SDATA(SI) 11
12 --- 12
13 GND 13
14 GND 14
15 +24V(VPH) 15
16 +24V(VPH) 16
Shin Heung Precision Co., Ltd.
Size A3
TITLE : STM-320 CONN
CONN PCB (TPH/MOTOR)
Rev 1.2
Date 2004.02.10
Drawn by Hyun-Oh,Yun
File Name STM-320 CONN.SCH
Sheet 1 of 1
CON-BOX,16P,2MM,2R,ST
CON-BOX,39P,2MM,2R,ST
CON-BOX,4P,2.5MM,ST
VPH
VCC
(+24 V)
C1
1000uF
35V
STROBE = LOW ACTIVE
(STM-310 = HIGH ACTIVE)
DISCON INPUT
Harness Connection
(MAIN)
(CONN)
JOURNAL MOTOR
RECEIPT MOTOR
PAPER-END SENSOR
RECEIPT SIDE
JOURNAL SIDE
MAIN APPLICATION
74HC14
150K
270[Ohm]
U1
U2
SG-105F


Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-390M
SERIAL INTERFACE PCB
Rev 1.2
Date 2005.08.18
Drawn by S.M.K
File Name SERIAL IF.SCH
Sheet 1 of 1
CON-DSUB;9P,FEMALE,AN
CN3:I
CN3:C
CN3:B
CN3:D
CN3:F
CN3:E
CN3:A
CN3:H
CN3:G
VSERIAL
TXD0
RXD0
DTR0
DSR0
GND
TXD0_OUT
RXD0_IN
DTR0_OUT
DSR0_IN
CON-DSUB;9P,FEMALE,AN
CN4:I
CN4:C
CN4:B
CN4:D
CN4:F
CN4:E
CN4:A
CN4:H
CN4:G
TXD1
RXD1
DTR1
DSR1
GND
TXD1_OUT
RXD1_IN
DTR1_OUT
DSR1_IN
CN2:6
CON-BOX;6P,2.5MM,ST(YH)
VSERIAL
TXD0_OUT
RXD0_IN
DSR0_IN
DTR0_OUT
CN1:A
CON-BOX;22P,2MM,2R,ST
VSERIAL
TXD0_OUT
RXD0_IN
DTR0_OUT
DSR0_IN
TXD1_OUT
RXD1_IN
DTR1_OUT
DSR1_IN

MEMO

UPDATE LOG

Application Date	Page	Part #	Notes (Cause & Solution)	S/Bulletin

Use this page to record any special servicing information such as Service Bulletins or Supplements.
When possible, record changes to Code numbers directly on the actual Parts List.
Always records Service Bulletin numbers and Application Dates on this log to ensure that your data is as current as possible.

SAM4S

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Printed in KOREA

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Code No. : JK68-70113A